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The Operation of Exhausters.

[By "A MANCHESTER MAN."]

Ever since the science of gas making reached a large commercial extension the gas exhauster has been the object of unremitting attention, directed towards the perfection and standardization of design, with the result that the modern gas exhauster is probably one of the most perfect examples of the complete application of a means to an end at present in existence. At the same time the most perfect of machinery has to be maintained with some amount of care, since otherwise trouble in operation develops and, from time-to-time, through causes which are quite outside the ordinary range of trouble to be met by ordinary designing and care in construction on the part of the manufacturers, troubles arise which have their points of interest and instruction.

It will, therefore, be interesting to survey briefly the points for which the operator of a gas works plant should be on the lookout in connection with the exhauster in order to secure continuously satisfactory performance. It is obvious that, in an exhauster, where so much depends upon the accurate maintenance of clearance between the fixed and revolving parts of the mechanism, very great care should be paid to the condition of the bearings. Ample bearing surfaces are necessary, combined with efficient means of lubrication, and the wear of the bearings ought to be kept under constant observation so that they may receive attention before they have gone too far. Many types of bearings have means of adjustment for the purpose of keeping the revolving parts in true center with the stationary portion, and, where this is the case, the use of feelers to accurately determine clearances, should be encouraged. Another point which requires attention, and which renders the advisability of a frequent opening up of the exhausters and attention to its internal parts, is that the springs, which make the joint between the blades of the exhauster and the cylindrical outside case, are apt to break or gradually to lose their nature. Any such fracture involves loss of efficiency in the exhauster, and it is possible that, should portions of the spring fall into the clearance, there may be trouble of a larger nature, due to the impact of the blades on solidly resisting substances. It is advisable, therefore, that exhausters should be overhauled fairly frequently in order to see whether any of the springs are exhibiting signs of deterioration. It will be noticed during the operation of gas exhausters that, from time-to time, there is the danger of the oil channels becoming choked with a thick substance resembling pitch, which, if allowed to accumulate, chokes the passage of the oil and causes heating. If the oil channels cannot be cleared by flooding them with creosote, it is necessary to temporarily put the exhauster out of action and remove the end plate. When this is done it is possible to scrape out the grooves, and the operation, if smartly performed, need not keep the exhauster out of action long.

Where a belt drive is employed varying series of troubles are introduced, due to the common defects of belts; and, speaking generally, it is advisable, wherever possible, to do away with belt-drives in favor of direct coupling between the prime mover and the exhauster. This is not only useful from the point of view of economizing space, but also in that it eliminates the slipping and stretching of the belt; the necessity of keeping it in good condition, and the always present danger of the belt breaking and flying, causing damage to surrounding objects. Where belt-drive is necessary it is advisable not to make the distance between the prime mover and the exhauster too short, as a short, tight belt is nearly always certain to give considerable trouble, more so than if the belt were long enough for a moderate tension to be maintained and arranged in such a way that the slack side of the belt is at the top of the drive. The weight of the belt in this way gives a tendency towards increased grip without undue strain on the material of the belt. A good deal of unnecessary wear-and-tear on the exhauster could be saved if reasonable attention were paid to other parts of the equipment, and this is illustrated by an experience which will in every probability not be confined to one gas works. During peak loads on one gas works both exhausters had to be worked together in order to keep up a sufficient exhaust on the inlet to equalize the seal in the hydraulic main, etc. It was, however, discovered on investigation that the foreman was working with more zeal than was absolutely necessary, he imagining that he was safer in doing this. When, however, the seals were reduced to the lowest possible value, with the hydraulic water weir valve in use (namely, $\frac{1}{4}$ inch), it was discovered that one exhauster could easily perform the work, the other machine being then standing in readiness in case of breakdown. The amount of wear-and-tear in the running plant saved in this way was, therefore, considerable, and the plant was accordingly working at much better value. The difference in the amount of work to be done was the reduced colmun of water or liquid to be held up in the hydraulic main and the conditions in the retort were, consequently, the same as before. It will probably be found on investigation that a good many minor points of this description, if thoroughly gone into, would result in increased efficiency and economy in the working of the exhausters, wherefore attention is here drawn to the matter.

The Relations of Employers to the Problems of Technical and Industrial Education.

[Communicated by Mr. ARTHUR J. ROWLAND, Chairman Industrial Education Conference, Public Education Conference, Phila.]

Everyone who has studied the subject at all knows the intimate relation between the industrial standing of our country and the efficiency of those engaged in its industries; and, while this relation holds good for all, from the humblest unskilled operative up to the corporation manager, it seems especially important to have those in the lower places realize it, since their educational opportunities have been the more limited. Thousands of boys leave school yearly from the lower grades to go to work. To most of these will come later a keen realization of lost opportunities, and the absolute necessity of making up for them, for they enter commercial or industrial occupations utterly unfitted for advancement to higher positions. What they can do and how well their capabilities can be developed will, in most cases, depend on what possibilities the employer brings to their attention and makes available. Most employers, aware of this, try to help those who work for them to find ways of gaining the knowledge they need. Experience has shown that as a purely business proposition this pays, for the young fellow whose character and habits of life are known, and whose personality and ability have been tried out, is usually much to be preferred to any stranger when appointments are made to positions of larger responsibility.

Our main purpose is to point out some of the many educational problems which must be studied in order to decide upon the best plan of procedure in any given case.

Associations or clubs, whether local or branches of a national body, which meet periodically to hear an address or participate in a discussion are at best educational only in a supplementary way. Any study done in connection with them is not consecutive, and usually (to be beneficial) needs a foundation which is too often lacking. The corporation school is rather new, and for large corporations has interesting possibilities; but the tendency, however, is always to train for immediate usefulness in detail rather than in broad principles, while the variety of course which can be offered is bound to be small. If, for example, the school is organized to benefit the workers in the shop, what shall be done with those in the office who need an entirely different training? A correspondence school, within the corporation or outside its control, offers the only means of systematic study for those residing at considerable distance from the large centers of population, or where the number of persons interested in a given kind of work is too few to warrant the formation of a regular class. When schools with experienced teachers can be reached, where direct recitation methods are used, and where a variety of courses are offered, the establishment of regular classes in off-duty hours prevents the best method of giving the desired instruction. These usually take the form of night schools or evening classes. Night schools flourish wherever established, their advantages being fully recognized by those attending them. They yield immediate help over difficulties, by having an instructor at hand; opportunity to learn by the mistakes of others in the class; compulsory regularity in study, so important even to a very earnest student; the stimulus of numbers; the desire to stand well in the class; the possibility of drill; and many others. Such school work, in the evening or late afternoon, is likely to have a remarkable growth in the future. To the general public the work being done is practically unknown at the present time, and employers are just waking up to what has been and can be done. No matter what educational agency is used, problems arise that can be solved only by the co-operation of employers, employees, and teachers. What courses are needed? How much time can be required of busy men for school work? What fees are suitable? How shall those who have long distances to travel and high carfares to pay be accommodated? Should classes be established away from the schools, in shops or in offices, but under the control of their trained faculties? These are some of the questions that have not been fully answered, and the answers would probably differ with a change in locality. Other questions are almost wholly the concern of the employer, such as: What school and what kind of education can best help my employees to what I want them to know? Who of them can profit most by systematic school work? How can I help them to get it?

The only satisfactory way to reach a conclusion on these matters is to have some common meeting ground where discussion can have full play. In Philadelphia steps to this end have already been taken. Last Spring representatives of the Central Educational Institute of the Y.M.C.A., the Drexel Institute, the Franklin Institute, the School of Industrial Arts, the Spring Garden Institute, Temple University and the Wagner Free Institute of Science joined with representatives of the Philadelphia Trades' Schools and the Philadelphia and Camden Public Schools in arranging meetings for the purpose of becoming acquainted with one another's work, and the educational problems employers have to face. Wishing to avail themselves of the wide resources of the Public Education Association of Philadelphia, members of the faculties of the participating institutions, are now organizing a section of that Association, to be known as the Industrial and Technical Education Conference of the Public Education Association, the membership to consist of educators and employers, and the purpose is to seek earnestly the solution of the problems arising from the needs of the vast numbers of young people who have never had proper opportunities for securing that knowledge which will pave the way to better service and higher responsibilities.

It is hoped that the movement thus started will spread to include not only local representatives, but all those whose employees find in the large city opportunities which cannot be offered nearer.

[Communicated.]

A Producer for Gasifying Gas Coke.

An interesting installation of gas producer for the gasification of gas coke is to be found in the Foug Works, the Societe Anonyme des Hauts-Fourneaux at Fonderies de Pont-a-Mousson, France. It consists of five Hilger rotating producers of 2600 mm. internal diameter, made by Messrs. Poetter, Ltd., of Düsseldorf, Germany, a view of which is given in Fig. 1. By means of gas firing, with up-to-date

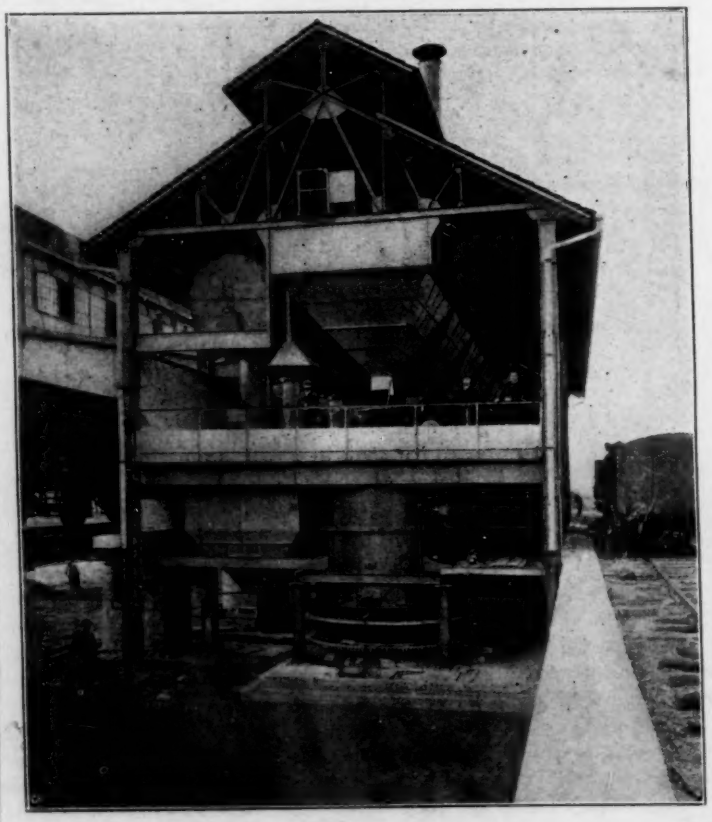


Fig. 1.

gas producers of this description, the generation of heat is centralized and reaches great efficiency. The means for conveyance of fuel and ashes are arranged most effectively, so that the cost of carriage is reduced and the services of men for handling the fuel and ashes are dispensed with. The quantities of dust and dirt connected with direct firing disappear entirely from the works, and the conveyance and combustion of the gas produced are at once easy and simple. In gas firing for metallurgical processes the minimum metal is lost and there is no deterioration of the material by particles of fuel; while for boilers, gas firing presents particular advantages where a low grade of fuel is used which could only otherwise be utilized with great waste.

The Hilger gas producer consists chiefly of a round, covered shell, lined with firebrick, with a double closing feeding-hopper. The lower portion is a fan-shaped hearth, rotated by means of worm gearing, on which hearth is fitted a 2-piece grate, lower circular portion and a star-shaped upper portion. These together form a star-shaped, downward-pointing opening which distributes the blast over the whole cross-sectional area of the producer. By means of a strong and simple mechanism, the ratchet catching the driving wheel of the endless worm works alternately in opposite directions of the ratchet wheel, causing a combined forward-and-backward rotation after the style of the "Pilgrim's step." Fig. 2. shows producer in plan and

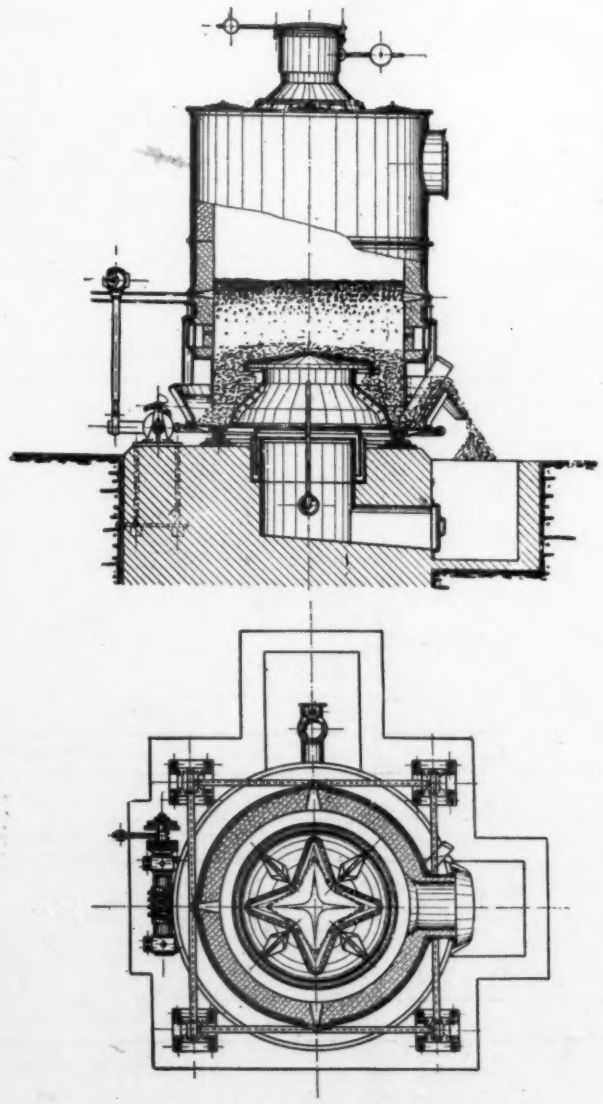


Fig. 2.

elevation, and Fig. 3 the driving gear for imparting this reciprocating movement. By the rotation of the ashpan and star-shaped grate the ash producer is kept in motion preventing the formation of clinker. The constant turning of the ash and fuel causes new surfaces of the latter to come into contact with the passing blast with the result that the gasification is hastened.

When gas producers have a grate rotating only in one direction, when a fuel poor in ash is used, it is often necessary to stop the ashpan for a certain time, which increases the formation of slag and discounts one of the chief advantages of rotating grate construction, which of course is more expensive than the fixed grate type. With the mechanism, however, it is possible to make the two motions equal, and the removal of ashes can, therefore, be stopped entirely while still subjecting the contents of the producer to very lively motion. The Hilger gas producers operate without water cooling and the firebrick lining in the fire zone shows a smooth and glassy surface. The fire bricks absorb on the side towards the fuel the temperature of the slag, but, owing to their high melting point, do not run. The slag accordingly remains in a liquid state and runs, assisted by the quick motion of the fuel column, down the interior wall of the producer and thus avoids the sticking of slag lumps to

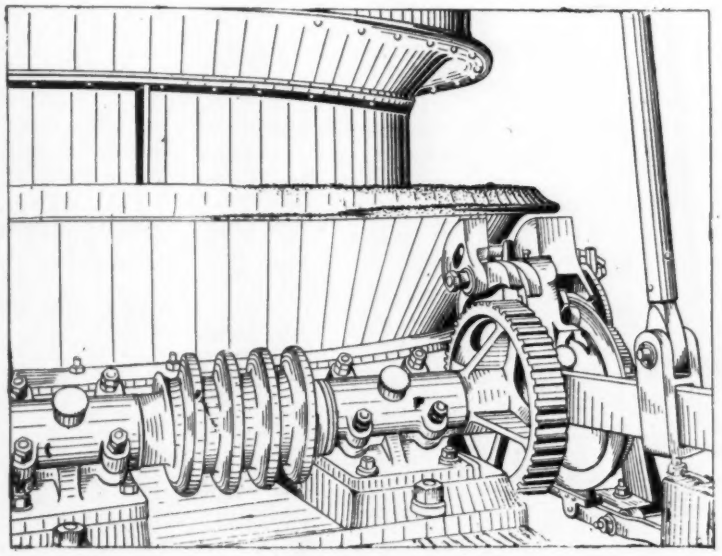


Fig. 3.

the walls. If the producer were water-cooled the slag would be cooled and caked by contact with the wall of say 70° to 90° C., and could not run down. The slag mantle formed in this way would increase in thickness as long as the influence of the water-jacket was felt, and this slag mantle might be anything from 250 to 300 mm. thick, thus reducing the capacity of the producer by reducing the cross section 30 to 40 per cent. Moreover, any interruption of the water supply is a danger in a water cooling producer, and the cost of the cooling water used is very considerable.

Fig. 4 shows the detailed arrangement of the feeding cone, from

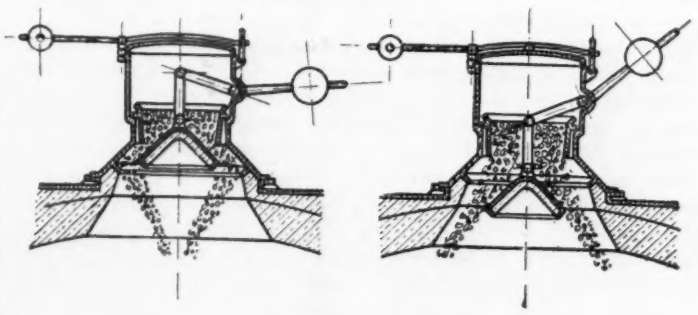


Fig. 4.

which it will be seen that, if the counterpoise of the cone is lifted slowly the fuel falls to the middle of the producer, while the fuel is thus thrown towards the outside shell when the counterpoise is lifted quickly, and any hollows forming in the fuel column are quickly removed by the rotation. The equal distribution of the blast, resulting from the star-shaped openings lying all on the same level, causes the majority of the slag to cool before it has a chance to form large lumps. This granulation of the slag is further assisted by the quick movement of the grate. Owing to the equal distribution of the blast, with the height of the fuel column from 800 to 1,000 mm., a high quality of gas can be produced, whereas, in producers with conical grates the height of the fuel must never be less than 1,200 to 1,500 mm., as they are liable to the formation of a central fire. The short column of fuel in the producer makes the poking much easier, and only short poking bars are required. The flat grate top is covered by a cone of insulating ash, and equal distribution of the blast is assured, even if the grate top be buried in wholly burnt-out ash. With tower-shaped grates the greater part of the blast issues from the upper part of the grate, and this is favorable to the formation of a central fire. To avoid this it is necessary to lower the ignited zone in the producer by throwing out the ash, and the removal of the ash endangers the grate top. With the Hilger producer efficient cooling of the grate top is obtained, because both the air and steam pass under the lower portion of the grate top, such an arrangement being, of course, impossible with tower-shaped grates having air outlets at various heights. Practical operation of this type of producer, as shown by tests made in Germany and England, give very favorable results.

Store Lighting.

[A paper read at Pittsburgh Meeting, Illuminating Engineering Society, by MR. J. E. PHILBRICK.]

The author hopes that the tests and data of this paper and a discussion of them may help towards eliminating the old "hit or miss" methods used by commercial departments in securing business and in making installations.

The following table gives average results of tests of the lighting installations in several stores, plans of which are shown:

TABLE 1.

	Nominal Consumption of Unit Cu. Ft.	Lumens per Cubic Feet of Gas per Hour, —Light Ceiling— With Light Walls.	With Dark Walls.
Reflex lamps with frosted tip cylinders, prismatic or light opal concentrating reflectors	3½	125	114
Reflex lamps with frosted tip cylinders, prismatic or light opal distributing reflectors	3½	110	100
Reflex lamps with frosted tip cylinders, French roughed ball globe	3½	95	70
Reflex cluster lamp, 4-mantle, with alabaster globe	13	85	64
Inverted 5-mantle arc with alabaster globe.	16.6	87	65
Upright 4-mantle arc with opal reflector and alabaster globe	20	75	55
Upright 4-mantle arc with alabaster globe only	20	66	48

The installations tested were selected at random and under ordinary working conditions, no special preparation of lamps or mantles being made in any case. If renewals had been made they were made at the ordinary time for cleaning, and as shown there is but one case in which the units had received attention within 1 day of the time of making tests.

For some time the opinion has prevailed that figures giving the performance of gas lighting units required radical discounting in order to express the actual results upon a consumer's premises, under the conditions of care and attention usually encountered in actual service. Obviously, it is most important for the man responsible for the success of any business to obtain accurate information on the service rendered by his product, with particular reference to those features directly under the observation of the consumer, and upon which the latter bases his judgment of the service and product. Many gas companies have been deterred from gathering this data by the effort required to obtain it; but I believe that the value of this information is amply demonstrated by these tests which were made in York, Pa. Tests of this character not only enable the manager to determine the competitive position of his product and to keep a check on the capacity of his manufacturing distribution and maintenance departments as regards the performance of their various functions in supplying lighting service, but give a basis for calculation by salesmen for designing installations and advising customers. When salesmen use data furnished by the manufacturer of appliances, they are naturally inclined to make liberal discounts to allow for differences between service and laboratory conditions, and for the pardonable optimism expected from the manufacturer.

The accompanying table published in the "Gas Solicitor's Handbook," was believed at the time of publication to be representative of the results that might be expected in actual service under good conditions, with clean lamps and new mantles of good quality; and laboratory tests indicate that the depreciation over the reasonable period of time between maintenance calls is negligible. It was desired to substantiate this in practice, and I am much gratified to find that it is so.

Lacking facilities for determining the gas consumption in each case, 3½ cubic feet per hour was taken as a close approximation to the actual consumption, the sizes of the mantles indicating that on gas of the quality furnished, this assumption was reasonably accurate. Tests made upon new mantles of known efficiency confirmed this.

In determining upon a procedure for the tests, horizontal illumination upon the working plane was selected as the basis. Not because this is the only plane requiring illumination, but because with glassware usually sold for store illumination, a sufficient degree of horizontal illumination is always accompanied by at leart a sufficiency of illumination upon other planes. The main purpose was to obtain information which might assist us in furnishing illumination to our customers under the most favorable conditions.

There are several matters that are worthy of some special attention in connection with these different installations. It will be noticed that in many cases the illumination was measured at comparatively few points, and while the numerical average of the results would not give the actual average obtained throughout the entire area, the numerical average is in all probability somewhat below the true average which would have been obtained had a greater number of readings been taken. For instance, in both Figs. 1 and 2, it will be seen

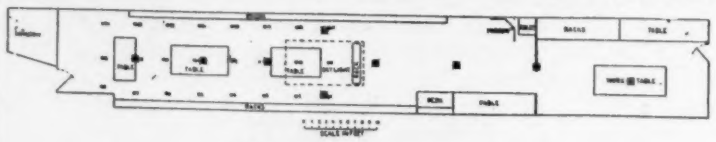


Fig. 1.—Plan of Tailor Shop.

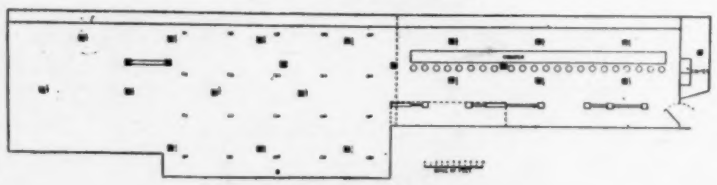


Fig. 2.—Plan of Lunch Room.

that most of the measurements were taken in the poorly illuminated parts of the room, very few being taken at points immediately beneath the lamps. This also applies to Figs. 3, 4 and 5. In Fig. 7

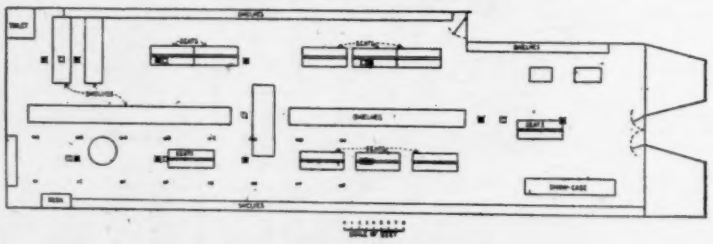


Fig. 3.—Plan of Shoe Store.

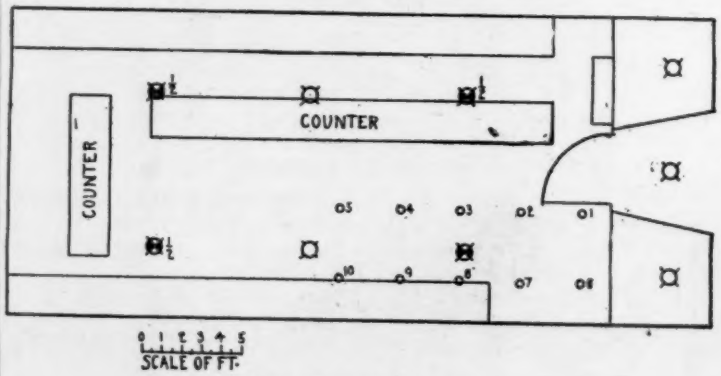


Fig. 4.—Plan of Jewelry Store.

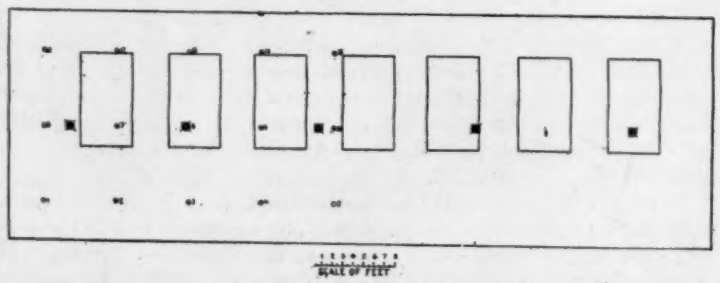


Fig. 5.—Plan of Pool Room.

the actual average illumination is probably far above the figures given, possibly as much as 20 to 30 per cent., because the lamps were quite low, and most of the readings were taken at points so far from the lamps that they were outside of the range of effective distribution. In this particular instance, the really important consideration is the amount of light on the face of the customer, and the lamps are properly arranged to distribute the light for this purpose and the general illumination of the room is of much less importance.

In the store shown in Figs. 7 and 8, a greater number of readings

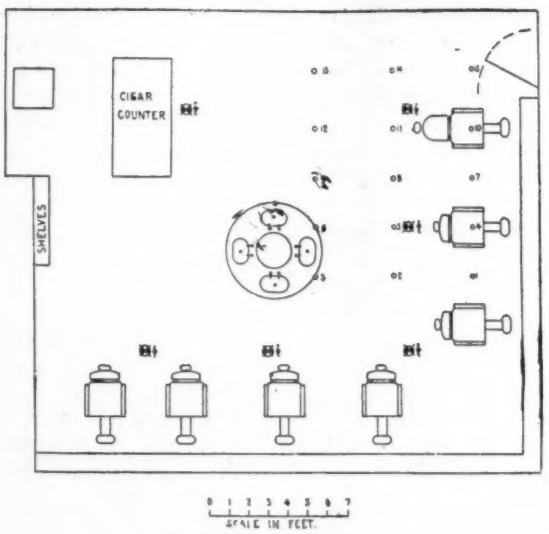


Fig. 6.—Plan of Barber Shop.

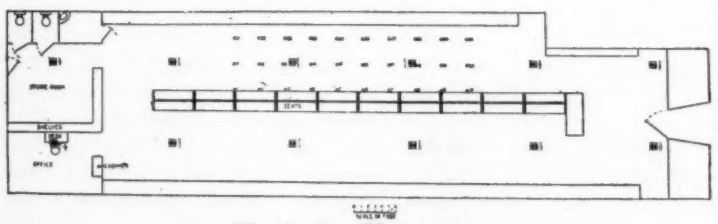


Fig. 7.—Plan of Shoe Store.

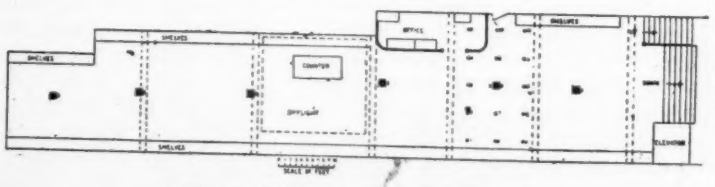


Fig. 8.—Plan of Carpet and Rug Store.

were taken and these probably represent truer averages than any of the others.

According to the "Gas Solicitor's Handbook" (p. 30), a cubic foot of gas per hour will produce about 110 effective lumens in a room with light side walls (that is, a sufficient amount of light to illuminate 110 square feet to an intensity of 1 foot-candle) and with dark walls 100 effective lumens. From the numerical averages obtained in the test noted in the last column there was only one installation that dropped sufficiently below this nominal efficiency to make the matter worth considering; and this in the barber shop, where the lamps were so low that most of the readings came outside of the effectively lighted area, so that as far as indicating the efficiency of the gas service and maintenance, this should be eliminated.

The installation shown in Fig. 1 had not been cleaned for 2 months, and was only 1 per cent. below the nominal efficiency. Installation No. 2 was 3 per cent. below.

The value of tests of this character, both to the gas company and to the industry at large, is quite apparent, and extends not only to the solicitation of new business, but to the proper design of lighting systems and the maintenance of existing installations. For soliciting new business, actual tests of installations of which the prospect has personal knowledge reinforce the arguments of the salesman most forcibly. In many cases, contracts for lighting hinge upon economic considerations, and every salesman claims the greatest economy for the particular illuminant he happens to be selling. His claims are of necessity based upon laboratory tests, or upon service tests in other localities, in which the conditions may or may not approach those in his own town, and he can submit no evidence of the validity of his claims that will have much weight with the customer. In such cases tests upon installations in the same locality are very convincing, particularly if some of them happen to have been made upon the premises of the customer.

In the case of the barber shop shown, the proprietor himself took readings with the operator and saw for himself the comparison between competitive illuminants, so far as the amount of light he was getting was concerned, and even though the amount of light fell 43 per cent. below the theoretical, the illumination was nearly twice that which was given when the shop was lighted by the competitive illuminant. A test like this gives the consumer exact knowledge of the comparative value of competitive illuminants, and is a valuable reference for the solicitor of the gas company, inasmuch as the conditions are approximately the same in any city, and the solicitor has but to refer to the test and the consumer personally, for confirmation of the data with which he is trying to secure the business.

Photometric Data.

Fig. 1.		Fig. 2.		Fig. 3.		Fig. 4.		Fig. 5.		Fig. 6.		Fig. 7.		Fig. 8.	
Station.	Foot Candles.	Station.	Foot Candles.	Station.	Foot Candles.	Station.	Foot Candles.	Station.	Foot Candles.	Station.	Foot Candles.	Station.	Foot Candles.	Station	Foot Candles.
1	1.6	1	6.0	1	3.1	1	2.2	1	1.30	1	3.6	1	2.20	1	1.34
2	2.6	2	5.3	2	3.9	2	5.5	2	1.00	2	6.2	2	3.00	2	2.09
3	3.8	3	4.5	3	5 7	3	7.8	3	1.16	3	5.5	3	4.50	3	2.74
4	4.0	4	3.3	4	7.3	4	7.0	4	.80	4	2.5	4	5.00	4	2.40
5	4.3	5	4.5	5	4.8	5	4.0	5	.90	5	5.6	5	3.60	5	1.15
6	4.1	6	5.2	6	6.6	6	1.9	6	13.00	6	3.0	6	2.60	6	1.34
7	3.7	7	4.2	7	2.25	7	4.25	7	6.50	7	4.0	7	4.30	7	1.96
8	2.7	8	1.85	8	5.8	8	8.0	8	12.50	8	7.3	8	5.15	8	3.09
9	2.3	9	5.8	9	5.1	9	7.2	9	5.50	9	1.5	9	4.25	9	3.05
10	5.2	10	5.3	10	2.0	10	4.7	10	9.20	10	4.7	10	3.00	10	1.52
11	7.8	11	3.7	11	6.4	..	..	11	1.46	11	7.0	11	2.30	11	1 70
12	6.8	12	1.78	12	4.0	..	..	12	.86	12	2.8	12	3.60	12	3.03
13	7.0	13	5.1	13	6 3	..	..	13	1.77	13	3.3	13	6.08	13	3.53
14	6.7	14	5.0	14	4.4	..	..	14	1.13	14	4.4	14	5.26	14	3.47
15	6.0	15	4.0	15	3.2	..	..	15	1.79	15	1.45	15	3.54	15	1 47
16	3.65	16	2.2	16	3.0	..	..	.	....	..	..	16	3.20	..	....
17	1.6	17	5.6	..	..	..	..	..	....	..	..	17	4.45	..	....
18	3.2	18	3.3	..	..	..	.	..	....	..	.	18	5.40	..	....
19	4.5	19	1.74	..	..	..	..	..	....	..	..	19	4.20	..	....
20	4.5	20	2.2	..	..	..	..	..	....	..	..	20	3.10	..	....
21	4.6	..	..	..	..	..	..	..	...	..	..	21	2.70	..	....
22	4.5	..	.	..	..	..	..	..	....	..	..	22	3.00	..	....
23	4.9	..	..	..	..	..	.	..	....	..	..	23	3.65	..	....
24	2.4	..	..	..	..	..	.	.	....	..	..	24	3.75	..	....
..	..	..	..	..	..	..	..	..	....	..	..	25	2.90	..	....
..	..	..	..	..	..	..	..	..	....	..	..	26	2.20	..	....
..	..	..	..	..	..	..	..	..	....	..	..	27	3.55	..	....
..	..	..	..	..	..	..	..	..	....	..	..	28	4.10	..	....
..	..	..	..	..	..	..	..	..	....	..	..	29	3.55	..	....
..	..	..	..	..	..	.	..	..	....	..	..	30	2.40	..	....

Fig. No.	Business.	Gas — Area Sq. Ft.	Ceiling Height.	Height of Lights.	Walls.	No. of Outlets.
1	Tailor shop	979	14′-0″	9′-	Medium	6
2	Lunch room	2,704	12′-8″	10′-6″	Medium	16
3	Shoe store	2,066	12′-0″	8′-6″	Light	11
4	Jewelry store	450	10′-6″	8′-5″	Dark	4
5	Pool room	1,487	9′-6″	7′-8″	Dark	5
6	Barber shop	611	8′-8″	7′-2″	Liggt	6
7	Shoe store	1,916	15 -0″	10′-0″	Light	10
8	Carpet store	2,318	18″-0″	11′-0″	Dark	6

Fig. No.	Business.	Gas — Lamps per Outlet.	Type.	Reflector.
1	Tailor shop	2	6 Reflex.	Extensive prismatic.
2	Lunch room	14-2L., 3-1L.	"	" "
3	Shoe store	2-1L., 1-2L. 6-3L., 2-4L.	"	" "
4	Jewelry store	2	"	" "
5	Pool room	4	"	" "
6	Barber shop	2	"	" "
7	Shoe store	2	"	" "
8	Carpet store	3	"	" "

Fig. No.	Business.	Gas — Total Con. per Hour.	Illumination — Average.	Minimum.	Maximum.
1	Tailor shop	40.0 cu. ft.	4.26	1.6	7.8
2	Lunch room	102.3 "	4.2	1.74	6.0
3	Shoe store	99.0 "	4.61	2.0	7.3
4	Jewelry store	26.4 "	5.25	1.9	8.0
5	Pool room	66.0 "	3.92	0.8	13.0
6	Barber shop	39.6 "	4.06	1.45	7.3
7	Shoe store	66.0 "	3.76	2.20	6.08
8	Carpet store	59.0 "	2.25	1.15	3.53

Fig. No.	Business.	Gas — Eff Lm. per Cu. Ft. or Watt. Actual.	Theor.	Per Cent. Actual below Theor.	Time Since Maintained.
1	Tailor shop	104.0	105	0.1	2 Months
2	Lunch room	108.0	105	*3.0	1 Day
3	Shoe store	96.2	110	12.5	Not maintained
4	Jewelry store	90.5	100	10.0	1 Month
5	Pool room	88.3	100	12.0	1 Month
6	Barber shop	62.6	110	43.0	1 Week
7	Shoe store	109.5	110	0.5	1 Week
8	Carpet store	87.6	100	12.2	1 Month

* Increase.

I believe that it would be of much value to the commercial departments of all the gas companies to have tests like these made and printed for their solicitors, enabling them to meet the question, "How do you know?" with data which applies to the question at hand, and not only to an irrelevant mass of figures which may mean nothing under the local conditions. The great help to solicitors is not that the consumer will understand terms of illumination intensity, but that he can see for himself the real value of his lighting and the effect on his pocketbook in dollars and cents.

Heretofore installations have been designed at random, and the lighting is often not satisfactory upon the first trial; a second and sometimes a third attempt are necessary to give the consumer the proper light in the right place. This often entails considerable expense to the consumer and company and creates dissatisfaction. While the lighting engineers of manufacturers have been at the disposal of the gas companies for some time back, to lay out installations and do all the illuminating engineering work, how many companies have taken advantage of the offer? If solicitors would make a series of tests and compute a table of lighting efficiency in various stores they could prevent mistakes in future installations.

Manufacturers' hand-books are good, but they are too often discounted or ignored; but data gotten right in the field under local conditions cannot be discounted or ignored, and are convincing facts. One test which I did not have time to make, but which would have been advisable, was on temperature at various points in our stores under the gas and electric lighting, taking into account the outside temperature difference on the days of test. I believe the heat objection against gas lighting can be greatly diminished, if not eliminated.

Lastly, it is realized that the efforts of the illuminating engineer are entirely lost if the lamps are not kept clean and the mantles renewed at proper intervals. It is absolutely necessary to have men who are capable and intelligent, who have some knowledge of the lamps they are cleaning; and who know when the adjustment is right to give maximum efficiency. Too often companies try to economize on this most important part of their business by employing boys at small wages, expecting them to become illuminating experts. To my mind the only way to pay lamp maintainers is on a sliding scale, with deduction for complaints on lamps which they have cleaned. The lamp, whether gas or electric, must have clean glassware and bulbs, for much business is lost by our failure to attend to these features. Of course, it costs more to maintain lamps properly than it does to half clean them, trying to keep the cost down at the expense of the illumination. This, however, can be met by a proper and not excessive charge, based on the sliding scale of consumption per mantle. (It is obviously not fair that the large consumer should pay the same rate for his maintenance as the consumer who uses his lights merely as a makeshift.) The following schedule is giving entire satisfaction to the consumer and company in York.

YORK GAS COMPANY,

York, Pa., ...1913.

The undersigned at No.....Street, York, Pa., hereby makes application to the York Gas Company to use gas for illumination, at the regular rate of the Company.

It is further understood that this application, being approved, the York Gas Company agrees to loan and install the necessary gas lighting fixtures, piping, etc., free of cost.

In all cases where combination gas and electric fixtures are specified and installed, the undersigned agrees to use gas regularly on such fixtures from September 1st to May 1st, that said fixtures remain in his premises.

These fixtures will be given regular monthly inspection, new mantles supplied as needed, be cleaned and adjusted and be given such other additional attention as may be necessary to keep fixtures in good working order.

In consideration of the above the undersigned agrees to pay maintenance according to the following scale:

Consumption	per	mantle	per	month,	50	feet	or	less...	15	cents	per	month.
"	"	"	"	"	100	"	"	"	...10	"	"	"
"	"	"	"	"	125	"	"	"	... 9½	"	"	"
"	"	"	"	"	150	"	"	"	... 9	"	"	"
"	"	"	"	"	175	"	"	"	... 8½	"	"	"
"	"	"	"	"	200	"	"	"	... 8	"	"	"
"	"	"	"	"	225	"	"	"	... 7½	"	"	"
"	"	"	"	"	250	"	"	"	... 7	"	"	"
"	"	"	"	"	275	"	"	"	... 6½	"	"	"
"	"	"	"	"	300	"	"	"	... 6	"	"	"
"	"	"	"	"	400	"	"	"	... 5½	"	"	"
"	"	"	"	"	500	"	"	"	... 5	"	"	"
"	"	"	"	"	600	"	"	"	... 4½	"	"	"
"	"	"	"	"	700	"	"	"	... 4	"	"	"
"	"	"	"	"	800	"	"	"	... 3½	"	"	"
"	"	"	"	"	1,000	"	"	"	... 3	"	"	"
"	"	"	"	"	1,250	"	"	"	... 2½	"	"	"
"	"	"	"	"	1,500	"	"	"	... 2	"	"	"
"	"	"	"	"	2,000	"	"	"	... 1	"	"	"

All maintenance to be paid monthly.

Orders taken by..... Signed.....

Finally, gas men should appreciate the possibilities of gas lighting, determine exactly the intensity of light in store-rooms, factories, etc., approach consumers with more intelligible, convincing data, and keep the lamps clean and properly adjusted.

By doing this, it has been said, "Two units can be made to grow where only one grew before." The writer wishes to acknowledge his indebtedness to Mr. R. F. Pierce, for his help in the preparation of this paper.

Influence of Copper on Corrosion of Iron and Steel Sheets.

In the JOURNAL for April 28th, attention was drawn to a paper by Mr. D. W. Buck, in which he reported, to the American Chemical Society, the results of some experiments on the atmospheric corrosion of sheets of commercial basic, open-hearth steel, of pure ingot iron, and of steel with an added copper content. His deductions, which seemed to show a very decided increase of durability for the copper bearing steel, have been attacked by Dr. A. S. Cushman, Director of the Institute of Industrial Research, in a pamphlet of 47 pages, on "Purer Iron vs. Copper Bearing Steel." Dr. Cushman criticises Mr. Buck's method of manufacturing the copper-steel (adding the copper in the ingot mold rather than in the furnace), and also the short time (9 months) of the test, which he characterizes as "an accelerated test, just as certainly and surely as the acid test is subject to the same criticism. He also objects to the gauge of the sheets tested, and remarks that "purchasers seldom if ever expect to put 27-gauge material out to weather exposure without some form of protective coating. * * * A sheet of metal 1/16-inch in thickness will last, under a given set of exposure conditions, much more than twice as long before complete failure occurs as a similar sheet 1/32-inch in thickness. * * * It is fair to insist that if the superiority of coppered metal is to be demonstrated the test should be made on material of all the competing kinds bought in the open market, and if the lighter gauges are selected in order to accelerate the failure, a sufficient number of specimens should be included to prevent any hit or miss calculations based on a few sheets which might or might not be representative of the general run of the type of metal under test."

He has examined iron from the links of the Newburyport bridge, that have withstood corrosion for 98 years, finding it unusually pure especially as to manganese and sulphur; but upon rolling this iron into 16-gauge sheets, they were "no more resistant to such tests than the general run of modern samples they were compared with. The thinner they were rolled down the more any lack of homogeneity they possessed asserted itself and tended to overcome the advantages of their generally pure nature."

Continuing with his own experience of copper and iron he says: "In 1909 and 1910 the manufacturers of pure iron in the open-hearth furnace were much troubled by the appearance of copper in their product. There was no indication at that time that this accidental copper did any harm to the iron; but since the prime object was to turn out a material of the maximum possible purity, the presence of copper was highly undesirable. It the meantime the appearance of copper to the extent sometimes of 0.10 to 0.15 per cent. in a product otherwise of unusual purity served to call attention to the importance of studying the effect of copper on the corrosion resistance of the material. At the same time that steps were being taken to eliminate copper to the lowest possible content, say not to exceed 0.3 per cent., a number of experimental heats were undertaken under the writer's supervision, in which copper was deliberately added to the open-hearth heats, so as to produce a series of alloys with a constantly increasing copper content up to 1.5 per cent. These successive heats were made under as constant conditions as possible, and were then

rolled into sheets of sixteen-gauge and put out to weather exposure. The sheets contained approximately the following percentages of copper: 0.03, 0.25, 0.50, 1.00 and 1.50. Some of the test pieces were exposed to the smoky atmosphere of a mill town and some to the purer air of Washington, D. C. These tests have been under constant supervision for three years. In no case has the presence of copper in this pure iron base been indicated as beneficial, while in some cases it has clearly appeared to be deleterious, increasing the tendency to a scaly rust formation. Some of these test pieces were "pickled" to a clean surface, neutralized and washed, while others were exposed in the black just as they came from the mills.

"If these tests had indicated that copper produced a higher resistance to corrosion, the writer would have been one of the first to announce the fact and advise the manufacturers to bring out a copper iron alloy to meet conditions where the tendency to corrosion was especially severe. The results of tests did not, however, warrant any such recommendation, but, on the contrary, seemed to indicate that the presence of copper ought to be avoided in these purer irons. It is, of course, possible that while copper is not beneficial to a commercially pure iron, it may improve an ordinary steel, owing to some influence which it may exert on the condition or distribution of the manganese of the steel, or for some other reason. At all events, if Mr. Buck's claims are justified, we are asked to believe that a carefully made coppered steel can be given an excellent quality of corrosion resistance. Whether this is entirely due to the copper or to a combination of circumstances, as already suggested, remains to be seen."

His conclusions are that as yet there is no reason to deviate from his previously formed opinion that, purity and homogeneity are the main determined characteristics of durable iron.

Saline Corrosion of Retorts.

Herr Zinck, at the last meeting of the Association of Gas Engineers, of Saxony and Thuringia, spoke of the corroding action of some coals upon retorts and coke ovens, which he designates "Saline corrosion," attributing it to chloride of sodium. Heat decomposes the salts of soda into an acid and a basic element, the acid combining with the free ammonia in the gas, and appearing in the ammoniacal liquor; while the basic element (sodium hydrate) is evaporated at a higher temperature, and combines with the brick forming a coating on it. This coating is sensitive to variations of temperature, and cracks, so that further quantities of hydrate fumes can enter. Owing to the cracks and the greater fusibility of the coating, the bricks seem swollen which is a sign of the damage. The proportion of silica decreases in the decomposed part of the retort, from 61.20 to 57.76 per cent., and even to 55.42 per cent. when it melts and runs; and the alkali increases from 1.22 to 4.63 per cent. Observations at the coke works demonstrated that 0.143 per cent. of salt in the water employed to wash coal, ruins a retort in 3 years. As soon as a coating is formed, charging and drawing make the surface crack, and increase the evil.

Herr Zinck related an experience with inclined retorts, where corrosion of the sides was so great that drawing took from 40 to 50 minutes, a skin having formed on the surface, and graphite accumulated underneath. The builders of the retorts maintained that it was saline corrosion, for which they were not responsible; but the managers of the works would not admit this, as the surface had only the characteristic inflation. The question was submitted to chemists, and the result of the investigation was that the materials were found to be not equally refractory in all parts as they should be.

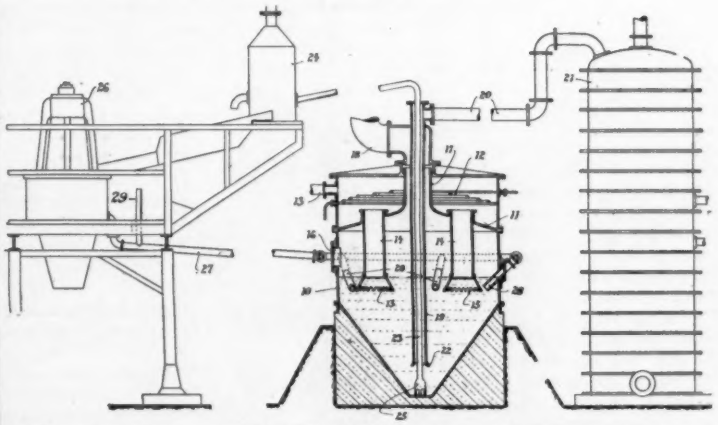
The Carlsruhe Central Research Department ascribes this corrosion to the high temperature produced by the combustion of graphite in the time between the drawing and charging of the retorts. The result is a fusion forming a crust, which subsequently peels off under the influence of variations of temperature. This explanation was confirmed by the identity in chemical composition of the superficial crust and the center of the bricks. It was also found that the damaged parts had been overheated. The deposit of graphite appears to be largely due to the action of the air. When there are cracks by which air can enter, graphite forms; but with 60 per cent. of nitrogen in the gas, there is no deposit. The best way to prevent the corrosion of retorts by salt is to employ good building materials, as there is practically no coal which does not contain from 200 to 1,000 grammes of chloride of sodium per ton.

The Koppers' Process for Sulphate Ammonia Production.

On the 16th ult. United States Letters Patent (No. 1,073,247) were issued to Mr. Heinrich Koppers (Essen-on-Ruhr, Germany), for improvements in sulphate of ammonia production. According to specification, the invention relates to a novel system of recovering sulphate of ammonia from the ammoniacal liquor of gas works, "without entailing any loss of ammonia." The usual method consists in either bringing the ammoniacal gas and vapors into intimate contact with sulphuric acid, but when the manufacturing is done in large volume it is virtually impossible to bring the acid and ammonia together in the proportions corresponding to the reaction shown in the chemical reaction expressed by

$$2NH_3 + H_2SO_4 = (NH_4)\,2SO_4.$$

As the quantity of ammonia in the gases or vapors varies, it is impossible to distribute the acid, even with the aid of special mixing devices, with such exactitude that each molecule of acid becomes saturated with two molecules of ammonia, and in view of the great danger of free ammonia escaping with the gases and vapors, it is necessary to make the saturation both slightly acid in order that the whole of the ammonia is retained. There is, however, again the possibility of the prepared salt containing free acid; *i. e.*, of its being acid. The difficulty is overcome, according to the present invention, by retaining an excess of acid at that part of the bath where the fresh acid and the mother liquor, separated from the previously formed salt, enter the same, and where the gases and vapors deprived of ammonia leave the bath, such excess being sufficient to insure that all the ammonia in the gases is retained with certainty. By introducing the other part of the ammoniacal gases or vapor at or close to the place of withdrawal of the salt, the free acid can be completely neutralized, and a neutral salt be obtained. At this point the ammonia may also be used in excess, since the risk of loss of ammonia is obviated by an adequate excess of acid. An apparatus suitable for carrying the improved method into effect is illustrated herewith, showing the apparatus in vertical section.



The saturation vessel 10 is divided into two compartments by a partition wall 11, the upper compartment containing a coiled heating pipe 12, and having an inlet pipe 13. Downwardly directed pipes 14 provided with flared, serrated mouths 15, depend from the partition 11, and the mouths 15 lie somewhat below the surface of the saturation bath in the vessel 10. Manholes 16 gives access to the interior of the vessel 10. The partition 11 has a tubular neck 17 connecting the lower compartment to the gas discharge pipe 18. Passing through the neck 17 is a pipe 19, which communicates at the top by means of a pipe 20 with the distilling column 21, and is provided at its lower end with a flared, serrated mouth 22. Inside the pipe 19 is the suction pipe 23 of an ejector 24, said pipe 23 having a bell shaped mouth 25 at its lower end. Adjacent to the ejector 24 is a centrifugal drier 26, the discharge pipe 27 of which leads back to the saturation vessel, and discharges by means of a plurality of delivery pipes 28, into the saturation vessel close to the level of liquid therein. Into pipe 27 opens a branch pipe 29 through which fresh acid may be introduced into pipe 27.

The ammoniacal gases from retort or oven, having been previously freed from tar and preferably cooled, pass through the pipe 13 into the saturation vessel 10 above the partition base 11, and are there heated by the coiled pipe 12. The gases then pass down the tubes 14 and through the mouths 15 into the saturation bath, where the am-

(*Continued on page* 250.)

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NEW YORK, MONDAY, OCTOBER 20, 1913.

[Special Editorial Correspondence.]

EIGHTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

HOTEL JEFFERSON, RICHMOND, VA., Oct. 15th, 1913.

The American Gas Institute's Eighth meeting, as to its preliminary session last night, and as to its first day's technical work, having gone on the records, let me briefly recapitulate the happenings, prior to attending the formal reception set for this evening at the joint instance of the respective representatives of the City and of the Chamber of Commerce. Yesterday afternoon and evening were passed in weather conditions that were quite Southern. And though the temperature was rather different from that which the Weather Man reported you were experiencing in New York, nevertheless the warmth was not of the enervating sort. Early in the evening the lobbies and other gathering places of this capacious, well-managed hotel presented the scenes familiar to the veteran attendants at these meetings, so there is little need to say that fraternal greetings were everywhere in evidence. The local Reception Committee (headed by that lively veteran, W. P. Knowles) was, of course, here-there-and-everywhere, heartily and unostentatiously busy, seeing to it that the travellers "came into their own." Nor was it a long hark, until 8:15 P.M., when the hundreds present were comfortably ensconced in the Jefferson's Auditorium, listening to the lecture on "Surface Combustion," by Doctor Charles E. Lucke, well-remembered and well-liked from his lengthy staff attachment with Columbia University, of New York. He was listened to with close attention by an audience numbering 400, many of whom were of the order feminine. Doctor Lucke interestingly recounted and described a great number of experiments, many of which antedated those narrated by Professor Bone, when the latter gave his celebrated lecture on this subject before the Institute at its meeting in St. Louis 2 years ago. His described applications of the principle to industrial apparatus, together with actual demonstrations of its value through the vehicle of domestic appliances, can surely be taken to indicate a real, positive step in a new direction regarding the utilization of gaseous fuels. The lecture at an end, and the Doctor having been heartily congratulated over the exceeding value of the information so clearly imparted, the watchword was, "Now, for to-morrow." This morning opened bright and fair, a positively typical Virginia October morn. And the old-new city, with its State building resting on ever-firm Shockoe Hill and Capital Square, was drowsily awakening through the dispelling of a Virginia mist, which luckily can cling without dampening. The whole scene compelled the mind of the viewer to revert almost 200 years. Staked out is 1733 and incorporated just 9 years later, it was chosen the State Capital in 1779, and 82 years later (1861) it became the Capital of the Confederacy. What a wealth of history is here involved? What things of great import are covered in this stretch of years? But I know that this is not a time for historic reflection, so let me merely say that the Richmond of to-day is not the Richmond of troublous times. And let me further add happily that the new Richmond feels the spur of commerce rather than of war; that her conflict is that of trade-and barter instead of the crack of musketry or the clash of the sword. At 10 A.M. President Walter R. Addicks announced the opening of the sessions. And he seemed quite like the addicks of yore, save that time had positively recorded his unceasing flight in the color with which that master chooses to paint the passing of the years. Yes, the gray tinge was there in plenty; but there was no other sign that time had made which caused the thought that the man was not still master. Never at a moment's loss to do or to say the right thing at the proper time, his conducting of the body's operations was marked with the precision, direction and sympathy (if I may so write) of a trained leader. Following the opening announcement, the President introduced the Hon. George Ainslie, Mayor of Richmond, who, in his brief, but hearty, welcome to the Institute, happily referred to the municipal gas works of the city, the original plant of which was designed and built under the direction of Mr. E. C. Jones, the well-remembered father of the well-loved son, Mr. E. C. Jones, Vice-President of the Pacific Coast Gas Association, and active in the ranks as Chief of the gas division of the business of the huge corporation known as the Pacific Gas and Electric Company. The Mayor also called attention to the fact that the plant had for years been admirably managed by the Senior Mr. John P. Knowles, and was now being admirably managed by his son, of like complete name. The welcoming was suitably concluded by a reference to the fact that in 10 years the output had been almost doubled, going in that period from an output of 340 millions cubic feet to an output of 605 millions. The response thereto was fittingly made by Mr. Charles M. Cohn, of Baltimore, and to show how well the members thought of the Mayor's welcome, a rising vote of appreciative thanks was tendered him. Mr. C. Willing Hare, as President of the National Commercial Gas Association, delivered a fraternal message from that Society, and then the formal order was declared. The Report of the Board of Directors having been disposed of, Vice-President Morehead assumed the chair and President Addicks read his address. In this admirable message, which is really burdened with evidence of the successful thought that resulted in its composition, the President naturally called direct attention to the perplexities of the actual state of the industry. Prominent in these unrests were the increased and increasing costs of materials entering into gas manufacture and the bolder demands of labor, and emphasized the grave importance of seeing to it that architects be kept to the line in respect of making provision for the placing of gas piping in modern structures of whatever type or sort. In fact, all points of interest were more or less considered. One recommendation regarding the direct affairs of the Association was that all the past-Presidents should be members of the Board of Directors. On resuming the chair, the formal reports from the Standing Committees were considered in this order: Trustees Gas Educational Fund, the results from the administration of which are becoming of greater value with each successive year; the Technical Committee; the Bureau of Information; Commercial; Arrangements; Classification of Awards, Panama-Pacific Exposition; International Uniform System of Pipe Threads; Calorimetry; and Thermal Value and Candle Power.

At this point the President read a message of congratulation and condolence, from Mr. George B. Cortelyou, President, New York Consolidated Gas Company—congratulatory, in that he knew the meeting was to be an unqualified success; condolatory, because he was unable to personally share in its activities. The way in which this message was received was pretty good evidence that the gas men had not forgotten his great services to the Nation in the times when Mr. Cortelyou's part was prominent. The first set paper to be considered was that by Mr. C. H. Stone, on "The Percentage of Gas Used in Mantles and Heating Appliances." This was the initial paper read as per the form authorized by the Committee on Abstracting Papers. The scheme seemed to work satisfactorily, and the paper brought on a discussion that was animated and useful. At this juncture Mr. E. C. Jones gave a spirited, verbal report respecting the current standing and extent of the plans underway affecting the proposed Gas Congress on the Coast in 1915. Mr. Forrest E. Barker, of the Massachusetts Board of Gas and Electric Light Commissioners, then paid good tribute in a short address to the exceeding value to the industry of Association meetings, whereupon we adjourned to the outer precincts, there to be officially photographed. Having been pictured, and the Jefferson's kitchen having been successfully appealed to for luncheon, the afternoon proceedings were to have been commenced with a consideration of the report of Committee on the Piping of Large Buildings; but, owing to the absence of the Chairman (Mr. O. H. Fogg, who is in Europe) the report was received and the work ordered continued. Mr. W. Cullen Morris then read the report (an excellent one it is) from the Committee on Pipe Standards, after which Mr. Barrows read a splendidly compiled progress report from the Committee on the Utilization of Gas Appliances. The next item was a report from Committee on Next Place of Meeting, and the recommendation that New York be such place was heartily indorsed. Mr. C. N. Stannard followed with the composite paper on "Closer Relations between the Engineering and Commercial Departments," the paper being the joint production of Mr. Stannard and Mr. F. Q. Cannon. So that the corelation of debate might be preserved, Mr. H. B. McLean read the kindred-topic paper on "How to Establish More Intimate Relations between Departments in the Administration of the Gas Business," by Mr. R. C. Ware. While the discussion on these closely related topics was by no means inert, it nevertheless could have taken on a much wider range than it actually did. This brought us to the report of the Nominating Committee—it is needless to say that the recommendations contained therein were unanimously indorsed, wherefore these gentlemen will rule the affairs of the ninth year of the Institute's existence:

President.—Mr. Wm. H. Gartley, Philadelphia.
First Vice-President.—Capt. W. E. McKay, Boston.
Second Vice-President.—Mr. R. C. Dawes, Chicago.
Treasurer-Secretary.—Mr. Geo. G. Ramsdell, New York.
Directors—Two-Year Term.—Messrs. Paul Doty, C. H. Graf, W. H. Blauvelt, A. E. Forstall and C. Miller.
Directors—One-Year Term.—Messrs. G. E. Macbeth and H. L. Rice.

Of course, the "elect" were called upon to acknowledge their preferment; and they did so—"more or less." Secretary Ramsdell now read the paper by Mr. Alten S. Miller, on "Gas Rates," after which the Committee on Revising the Constitution handed in its report, which was presented by its Chairman, the Hon. Ira C. Copley—he

doesn't seem to grow a bit older. The paper prior to adjournment was a gem. Its subject was "Accidents: Their Causes and Prevention," and its author was Mr. J. B. Douglas, of Philadelphia. It was illustrated by slides, and the lessons taught by it are of incalculable value. The author is Manager of the Claim Division of the U. G. I. Company, and this brings to mind the fact that Mr. Douglas last month brought out a set volume, at the instance of the U. G. I. home office entitled: "Accident Prevention: Safety First." And the writer makes bold to say that neither the office, showroom nor works of any gas company is fully equipped unless somewhere within quick reach a copy of this book may be obtained. The reception to-night promises great things, but that chapter may be better told to-morrow.—CAMP.

HOTEL JEFFERSON, RICHMOND, VA., Oct. 16, 1913.

The reception last evening, tendered by the city authorities, with whom were enlisted the services of Virginia's well-esteemed Governor and his tactful wife (Hon. Mr. and Mrs. W. H. Mann), was beyond doubt a really brilliant affair, and enjoyable as well. The affair was brought to a prelude period by the aid of an informal musicale, later cn abetted by a "narrative recital" in the Hotel's splendid Assembly Hall. And the dance which followed prompted a usually staid (and surely prominent) New Englander to remark 'twas an undoubted fact that the South and the North were "coming closer together all the time!"

To-day the sessions were sectionalized. The A Section was directed by President Addicks, and the first topic considered was the report submitted by the Committee on "Power Economies in Gas Plants." The valuable matter collected by Chairman C. L. Bruff and his aides will beyond cavil lead to practical results later on in many plants that will repay 50 times over the cost of membership and the expense consequent to membership in the Institute. And the same may be said of the second number, the paper by Mr. J. W. Shaeffer, on the "Handling, Storing and Sale of Coke," certainly a subject of moment in the present standing of the fuel market. Mr. J. G. O'Neill then cleverly described his system and plans of the "Removal of Hydrogen Sulphide from Coal Gas," mainly depending on thorough scrubbing with ammonia liquor. The afternoon session of Section A was given to the considering of these matters, in the order named: "The Physical Characteristics of Ferric Oxide," well told by Mr. W. H. Fulweiler, and nicely illustrated by actual experiment and clear lantern slides; the report of Committee on "Progress in Carbonization Methods"—and when it is said that it was presented by Mr. Herman Russell, it is also said that the presentings were well made. The report had the useful concomitants of slide illustratings and actual film displays of a retort house in operation; and Secretary Ramsdell read the report of the Committee on "The Naphthaline Problem of To-day," which certainly showed the markings of the careful thought of Mr. A. H. Strecker, Acting Chairman of the Committee. This brought the sessions of Section A to a close for the day. which puts over until to-morrow the respective papers, by Mr. O. B. Evans, "Some Notes on the Carbonization of Coal in Vertical Retorts," and by Mr. H. W. Alrich, on "The Behavior of Water in Holder Cups."

In Section B the order was about like this. The proceedings were ably directed by Vice-President Stannard, with Mr. G. I. Vincent at the Secretary's desk. Mr. Walton Forstall having read in abstract his paper on "The Installation of Cast Iron Street Mains" (it brought out a brisk discussion), and there being on the list several papers closely allied to distribution problems, it was determined to abstract these so that joint discussion could be had, wherefore the abstracts were thus made: "Installation of Mains and Pipe Lines of Steel and Wrought Iron," by H. L. Rice; "Street Main Standards," by G. I. Vincent; "Protection of Street Mains, by an Adequate System of Inspection," by C. C. Simpson; "Protection of Street Mains by the Intelligent Use of Underground Space," by J. A. Gould; and on "Organization and Equipment for and the method of Handling Street Leaks," by A. D. Whittaker. Naturally this Method saved much time, and the discussion was accelerated and generalized, at least 25 different speakers sharing in it. In the absence of the authors the joint paper by Dr. Sharp and A. H. Schaaf, on a "Portable Electric Photometrical Standard: Its Construction and Use," was read by Mr. P. S. Millar, and the paper by Mr. F. H. Gilpin, on "Automatic and Distance Ignition of Gas," closed the day's work in Section B. Right here let me say that the question or topic that seems paramount (yes, even to the exclusion of the increasing cost of materials of all sorts) is the importance of having the State authorities declare in favor of the calorific standard as the basis of the product sent out to the consumer. Not only does President Addicks in his address positively recommend this change, but the temper of those who engaged in the discussions is best shown when it is stated that many declared they conformed to the candle value prescribing, not that they deemed it proper to so do, but because the statutes so demanded. You may take it for granted that speedily the general laws governing this matter will uniformly declare for heating value as against candle power. Meanwhile the woman folks are being taken care of in royal manner. Theater parties, automobile rides, trolley car trips, luncheons, in fact, so much attention is being given them, that the "separate acts" are too many that they can all be jointly shared; so, some go one way, others another. At the luncheon, at the Country Club, which was a truly delightful function, a memorable happening was the graceful acknowledgment of the courtesies shown through a pretty speech made by Miss Corscot, of Madison.

The banquet hall of the Jefferson reflected an animated picture Thursday evening. At 8 o'clock the guests filed in and forthwith engaged themselves in doing the best they could with an assortment of provender, well cooked, well served, well wetted. The lengthy list of speakers named in advance was largely added to, a notable instance in this respect being Mr. A. J. Duckham, of the Woodall-Duckham concern, of England. The Governor and the Mayor, of course, were present, and the "gallery" consisted of perhaps 4 score of the fair sex, who looked in, "just to see how things were going along," on their return from the theater, where they had assisted in an inspection of the play entitled, "The Trail of the Lonesome Pine." In fact, Mrs. W. J. Clark, of New York, had a word-or-two to say in responding to the call of the Toastmaster. And this leads me to say that that important functionary was none other than the Hon. James M. Beck, whose services as Assistant Attorney General of the United States have made him world-famous. His conduct of the proceedings was simply great. When Mr. W. I. Clark, Chairman Commercial Committee, of the Institute, was called upon, he gave out some good "grinds" concerning several well known gas men, and as he uttered the name of the "grilled," the features of the victim, in caricature, were projected on a screen—"Ben." Kellum, the "transporter," and "Rob." Searle, the "live wire" were especially "well done." The crowning glory of the "picturing" came, however, at the finish when the features of Dr. Auer von Welsbach were shown in excellent projection. The evening was replete with enjoyment, and the sharers (these numbered close to 400) will long remember its pleasures. To-morrow the programme, in addition to the matters undisposed of to-day, includes the joint session with the Illuminating Engineering Society, during which these set papers will be considered: "The Importance of Direction, Quality and Quantitative Distribution of Light in Illumination," by M. Luckiesh; "Some Phases of the Illumination of Interiors," by Mr. P. S. Millar; and the "Gas Lighting of Interiors," by Mr. C. A. Luther. This is sufficient likely to cause a session in the afternoon, so what was then done shall have to be narrated in the JOURNAL for the 27th. The attendance registered to close on 500, and there was not a happening up to this that did not go to show the helpful bond of unity that exists in the ranks of the gas men.—S. K. C.—C. H. W.

CURRENT MENTION.—

MR. C. J. RAMSBURG, Assistant Engineer of Works, Philadelphia Gas Works Division, the U. G. I. Company, in whose service he has been since 1897, has resigned his position with that Company. He goes to Chicago, to hold the place of Second Vice-President to the H. Koppers Company. Mr. Ramsburg's career goes well to show the rewards that go with study, application and straightforwardness. He gained the Beal Medal, awarded by the American Gas Institute to him, for his paper on "Sulphur Compounds in Illuminating Gas," read at the 1909 meeting.

MOUNT VERNON, N. Y., had a gala evening on the 9th inst. Despite the misty atmospheric conditions, close to 25,000 people turned out to attend the doings consequent upon the formal opening of a certain section of Fourth avenue, the main business street of this beautiful city of the renowned, historically famous New York County of Westchester. A main feature of the "celebration" was the illumination of several notable buildings along the avenue, notably that of the Proctor theater and that of the Westchester Lighting Company, the fronts of both of which were fairly ablaze, from 7:15 to almost midnight. Another and very notable feature was the parade. Of course, the fire fighting men with their machines led the line, and then followed the industrial procession. The leader in this respect was the Westchester Lighting Company, and a correspondent forwards this description of its presentings: * * * It may be safely said that no other public utilities corporation in this country ever made a finer display than that put forth by the Westchester Lighting Company. It was remarkable for its numbers in the personal sense, its bands of music makers, automobiles, and the like. Floats carried many clever conceits, showing vividly the advantages of gas and electric currents for the streets, factories, public buildings, schools, homes, etc., of a modern community. There were transparencies, fireworks, glare and enthusiasm in plenty. The marching division naturally evoked the loudest outbursts. Led by the famous Fort Slocum Band (numbering sixty-odd instruments), President-Colonel Stratton headed the division, astride a steed worthy of his mount; and his handling of the animal caused many an onlooker to remark, 'The Colonel must have been a cavalryman!' Following these came the noted Styles band, from Yonkers, and a third section of melody-makers was in line a bit further down. Then in sequence showed representatives of the many and varied industries that have their headquarters in and around Mount Vernon. That the parade was a lengthy one may be comprehended when it is said it took up an hour to pass a given point. Of course, the current was turned on by the many-time Mayor Fiske, whose popularity seems to grow as his years go on. Of course, the story would not be complete without some mention of the courtesies extended by that prince of managers, Vice-President Clark, and his cultured life partner, Mrs. Clark, whose whole-heartedness have done much towards popularizing the great corporation, the active affairs of which he directs. Nor should omission be made of the name of the Company's Chief Engineer, Mr. Norman Macbeth, about whose ability, knowledge and lack of bigheadedness you are better posted than your informant; and even he knows them all rather intimately. Take it all-in-all, October 9th was a memorable occasion in this section of Greater New York."

(Continued from page 247.)

monia which they contain is absorbed, the gases then escaping through the central neck 17 to the pipe 18 for further use. The ammonia in the gas liquor formed by the previous cooling of the gas is removed in the distilling column 21 by means of lime and steam. The vapors from the column 21 pass through the pipe 20 into the inner pipe 19 and through the mouth 22 into the saturation bath, whereupon after absorption of the ammonia they escape with the gases through pipe 18. The salt formed accumulates at the bottom of the saturation vessel 10 around the bell 25, and is raised in the form of a slimy mass by the ejector 24, whence it passes into the centrifugal drier, by which the mother liquor is separated from the salt. This liquor flows through pipes 27, 28, into vessel 10 together with the necessary supply of fresh acid that is introduced into pipe 27 through branch 29. The absorption of the ammonia takes place in two stages. Owing to the addition of fresh acid to the mother liquid that enters the saturation vessel 10 through pipes 28, there exists within said vessel at the corresponding liquid level a certain excess of acid, so that all the ammonia passing said level will be absorbed. As the salt is withdrawn through the bell 25 from the bottom of the vessel 10, the liquid circulates from the top to the bottom, so that the acid lye containing salt descends to the part where the ammonia enters from the distilling column. This saturates the free acid in the lye or salt, so that the prepared salt is kept as neutral as it possibly can be. Owing to the introduction of an excess of ammonia at this part the ammonia remains uncombined. This, however, is not detrimental since this ammonia must subsequently pass the acid zone, where it will be combined. By admitting the retort gases into the saturation bath near its liquid level, the important advantage is obtained that the pressure of these gases need not be objectionably raised. The pressure of the vapors coming from the distilling column, however, may be readily increased so as to overcome the pressure existing at the bottom of chamber 10, for instance, by increasing the pressure in the distilling column.

The inventors claims are:

1. The process of producing sulphate of ammonia, consisting in introducing a part of the ammoniacal gas or vapor into a zone of a saturation bath in which an excess of acid is obtained by the admission of the fresh acid, and separately introducing the remainder of the vapor or gas at another part of the bath where it produces a neutral zone from which the salt is continuously removed.

2. Introducing a part of the ammoniacal gas or vapor near the surface of a saturation bath, where the fresh acid is also added and separately introducing the remainder of the vapor or gas into the saturation bath in proximity to the bottom thereof, where it produces a neutral zone, from which the prepared salt is removed.

3. Introducing cooled ammoniacal gas free from tar in proximity to the surface of a saturation bath, where the fresh acid is also added, the ammoniacal liquid separated by the cooling being treated in a distilling column, and the vapors produced therefrom be introduced into the saturation bath in proximity to the bottom thereof, where the salt is removed.

Budget Submitted by the Experience Editor (Mr. John Clements), Twenty-first Meeting, Pacific Coast Gas Association.

At that delightful, ever to be remembered, twentieth session, held in the city of San Diego, the President honored me with the appointment of Editor of the Experience Department. The duties imposed by this appointment seem to me to grow more and more important, as the present (or Twenty-first session) draws near. I fear, however, that the thought of its importance is not shared by many of my fellow members, or it may be that they do not fully understand what is meant by the term "Experience."

I have asked myself this question several times in the past few months. The term or word "experience" is defined by the authorities, as that which has been learned, suffered or done, considered as productive of practical judgment and skill; the sum of practical wisdom taught by all the events, vicissitudes and observations of ones life, or by any particular class or division of them. To quote from Emerson. "In a world so charged and sparkling with power, a man does not live long and actively without costly additions of experience, which, though not spoken, are recorded in his mind."

On June 9th of this year, our Secretary sent out my appeal to you for help, asking you to send in some of your personal experiences, along the lines in which we are mutually engaged. In the appeal I enumerated the various lines as follows: Manufacture and distribution; gas lighting; gas heating; gas cooking; sale of gas appliances; rentals; collections; your experience with gas versus electricity; consumers' complaints; personal experiences with individual consumers, etc.

The past year has indeed been an eventful one, full of experiences for many (if not all) of us. Many of them would have made good matter for this paper; but, owing to the proverbial modesty of the gas man, they have not been considered of sufficient importance. So, on these grounds, I excuse you this time, but insist that you do better for my successor.

Manufacture and Distribution.

Gas Lighting.—Under this head we find that gas lighting is still advancing, the gas arc holding first place where a great and concentrated amount of light is required; for large stores, factories and outside illumination, where volume of light and economy are considered, the gas arc holds first place. It is not the purpose of the Editor to point out any special type of arc lamp, or of any special make of gas appliance; but here is a very good story that comes awfully near doing it. This story was given out by the gas arc department of one of the large cities, and has been published in a special magazine; but, as the circumstance connected therewith has to do with one of the members of this Association, I have deemed it worthy of repetition: An old colored man called at the gas appliance store in * * * Cal., to place an order for one or two gas arcs. This man, like many others, did not know the type of lamp he wanted, but remarked he had heard of the Welsbach and the "Humpback," and asked our fellow member which one he would recommend.

Gas Heating.—Gas heating is becoming more popular every day, thus increasing the make and ontput in all our plants on the Pacific Coast. The various types of automatic water heaters are growing in favor. The fact that hot water can be had at the faucet, as readily as the cold water, induces modern people in modern houses to install and use such appliances, and in the more humble homes of working men we find the circulating boiler heater. These are convenient and economical, are easily and inexpensively installed; in fact, any handy man can connect them up and get results.

One of our members reports a case where a handy man man made such connection and got results, and it happened in this wise: The handy man purchased a water heater, and, thinking he would save a little money, told the clerk in the appliance store that he wanted the lowest possible price on the heater; that he intended to do the plumbing work himself. The result was that this man connected the fuel run to the water connection, with the further result that something more than ordinary condensation got into the fuel run, the meter and in the main outside, with the ultimate result that he not only put his own appliance out of commission, but that a great many others were without gas. So the Company received a great many complaints at the same time, and had a big job on its hands to find a low place in the mains to let out the water. Besides all this, many persons, not knowing the real cause, complained of rotten service.

Gas Cooking.—As to gas cooking one member sent this experience: "We sold a lady a first-class range. After we had installed it the lady complained of too great heat in the oven, causing cakes, bread or pies to burn on the bottom. Over the 'phone, we suggested to this lady that she cut down the flow of gas to oven burners. Not hearing anything more from her for sometime, we supposed everything was all right; however, we finally heard from her again. This time, however, the complaint was the reverse, in that she could not get heat at the bottom. We then asked her to let us send out our demonstratress. She answered, 'Yes; by all means, send her out.' That we did, and this is what the demonstratress found: Two inches of sand spread all over the bottom plate of the oven, thus holding back the heat from the bottom, directing it into the broiling oven. The demonstratress, of course, removed the sand, raised the rack, and did some baking, the result being full satisfaction. Meeting the man of the house sometimes afterwards, we asked how his wife was getting along with the gas range. He answered. 'Fine! Since your demon-straightner came out and removed the sand, everything is OK.'"

Rentals or Sales on the Installment Plan.—From a furniture dealer, who said: "We have been quite successful in the sale of gas ranges on the installment plan, although we find the Gas Company

is not very liberal in extending credit to would-be purchasers. At least that is what the would-be purchasers tell us. We sell any of our goods on the installment plan, which, of course, includes gas ranges. Usually the gas range is sold along with other household goods, and collections are made monthly or weekly as the purchaser arranges. We find that the average young woman wants a gas range, or else she will compromise on a coal range with a gas attachment, and I suppose you gas campany people find that even then she is most liberal in the use of the gas attachment. Of course, selling her a coal range means that the hot water for bath and other uses is heated from the coal range; but where we sell a gas range, we usually sell a circulating boiler gas heater, which means that all fuel used in the house is gas. Asking this party if he made any special effort to sell gas ranges, the answer was: 'Oh, no; we show people through our stove department and let them choose for themselves.' You gentlemen, managers of gas companies; note what the furniture dealer has said. Ponder on it and govern yourself accordingly!"

Collections.—A most important feature of all business. It is one thing to make a sale or to furnish a commodity, but it is quite another thing to gather in the shekels. As the sale of gas is, of its very nature, a credit business, because of the fact that it cannot be bought, sold, or delivered in the lump sum, the question of collection is all the more important. The consumer has completely used up or consumed our product several days, weeks, or months, before we can call on him for payment, We cannot by any legal process obtain possession of the goods we have sold him; therefore, it is all important that collections be promptly made. The experiences of this department, and those of the individual collector, are too numerous to mention. The greatest tact and patience are required of those who handle this branch of our work. Many excuses and complaints are offered to the man who rings the doorbell of the average consumer, therefore, I should say that a man must at all times be self-possessed, be able to hold back the wrath that is in him, always polite, do the best he can to gather in the shekels, be honest in making his returns and able to retire at night with a clear conscience and an unruffled temper. I may add here that the collection department is, of all other departments, the most important. The results of its work are felt all along the line—the man who furnishes raw material, those who manufacture, the manager and the everyday clerk and laborer, are all dependent on the successful management of the collection department, to say nothing of the men whose capital is invested in the enterprise.

Gas versus Electricity.—One member says that, in the ordinary business of his company, he has found many instances where the consumers gave up the use of current for gas because of first cost; and, further, because of the dependable conditions under which gas is supplied. These conditions are familiar to all of you and, therefore, need no explanation. Gas is always ready, always on tap, while a very slight tap will send electricity a glimmering. With the pilot light attachment, and the self-lighting, air valve device, instantaneous lighting is equal to the electric switch. Another member relates an instance in which fire occurred in a 2-story building, the lower part being occupied as stores. The latter were badly damaged; electric wires were severed and pulled down, but the gas runs attached to the ceiling joint remained intact and several gas arcs hung on their drops. The glass globes, of course, were broken, but the mantles hung in place and the lamps were burning after the fire had been subdued—another evidence of the reliability of gas.

Accounting.—The following experience is the result of presuming: In the regular way a closing statement was taken when occupants moved from a certain address; the closing reading showed, we will say, 289. The meter was locked, which means the gas was turned off at stopcock. This was some time early in the month. When the meter was read at the regular, stated time, it was returned as reading $\frac{334}{289}$ thus showing a consumption of 4,500 feet. As the company had not been notified by any one that the place was again occupied, this, of course, did not look right. Accordingly, a man was sent out to investigate, with the result that he found the house occupied by a new party. The man obtained the name of the new occupant, and, at the same time, took statement which showed the reading to be 289, the same as given at time meter was locked. The last statement shown in ledger that was just being closed was 334, and was transferred to a new ledger as 334, hence this statement coming in as 289, the bookkeeper presumed and made the account read $\frac{388}{334}$ thus again charging the party 5,500, or a total in the two transactions of 10,000 cubic feet, when as a matter of fact no gas had been used. The party was presented with the bill for the 10,000 cubic feet, but insisted she had not used any gas. As this sort of statement is very common, it was not readily accepted, and the payment of the account was insisted upon by the collection department. Shortly after the presentation of this bill, at the request of the consumer, the meter was removed and the out statement showed 289, confirming the statement of the consumer that no gas had been used, confounding and confusing the management, the collection and the complaint departments, and all of this because of a presumption on the part of a bookkeeper. Of course, in a large concern where over 75,000 accounts are handled every month, errors will, do, and are bound to, creep in. This experience is given for the purpose of showing that nothing should be taken for granted. The consumer in this instance was a very reasonable person. The incident was closed quite satisfactorily to all concerned, yet through it all was an undercurrent on both sides that all was not said and done strictly on the square. Be sure you are right; then go ahead. Guesswork is good when it hits; but it seldom hits.

$5,500

This from a Chinaman.—Mr. Gas Company: Gentelmens—You send me big bill one month; next month you send me li ttle bill what fo! 'usem gas alle time same. I think he leak, some time smeli velly bad. You sendem you partner down look, so he can smell and fix him soon, take him to your office.

Another.—Pacific Gas and Electric Co.—Dear Sir: My room has been fire two weeks ago so I will get off from that place. I beseech to your kindly sent you partner to come to take the gas meter off as soon as you possibly please. But the deposit receipt was burned up by the fire. Can you count him up so you see how much I ought to receive so you can send it to me to Gum Lung. Well se long Good Bye. Yours truly. CHANG YUEN.

This from a Son of Nippon.—"Honorable Sir Mr. Gas Company I wish to leave not your meter in the house when I go because I will move to ..... Street, so if you come now and count how I am to pay you this month, I will be much pleased to fix the honorable matter up so satisfaction will come to your company and to

Yours very much respect H. HONCHOH."

Personal Interviews.—From a member of the Commercial Department: A young man was given a district where it was especially desired the consumption of gas should be increased. This particular point was very effectually impressed on the commercial man. Increased consumption is that which you are working for. "And increased consumption it shall be, if I can make it so," he said to himself. One day, while talking to a prospective purchaser of a gas range, he happened to say, "I am working hard to increase the consumption of gas in this part of the city." "Oh!" exclaimed the woman, "That is why you are so anxious to sell me a gas range, is it? Well you can just trot along young man. My bills are big enough already." Moral, keep ever in view the main object; but don't always tell the other fellow. Another commercial man has this to say: I have charge of a district in which I am looking for new business, and incidentally giving considerable attention to complaints of consumers. One day, during the past year, I met a lady who had a sore grievance against the gas company, which ran something like this. She had two meters located under the front steps of a 2-story house, which house was supplied through one of these meters. The second meter supplied a small bungalow on the rear end of the same lot. She had requested the removal of one of the meters on account of the 2-story house being vacant. Accordingly a regular tag was made and in doing so the company number of meter was not given correctly. The result was the man removed the wrong meter and the woman was without gas to cook her evening meal. She telephoned to the company's office and the man was sent back to restore the meter. Now, this woman worked herself into a passion and, by

the time the man returned to correct the error, to use her own language, she was good and hot. Accordingly she pitched into the meter man, and, over his shoulders, the whole management. The meter man, however, was mute; that is, he said nothing, offering no excuses. Simply did his duty in restoring the meter to its proper place and, after only a short delay, the woman was again supplied with gas. When I met her (it was several weeks after the incident here related) she was still hot, not so much (she said) at the gas being shut off as she was at the fact that the man would not talk back, and give any reason for the blunder he had made. Now, as to the facts in the case. I learned, on investigation, these were not with the meter man or with the meter department, but with herself. The front house had been occupied by Martin A. Smith, her father, who died. Her name was Mary Ann Smith. On the company's books the accounts were carried as M. A. Smith, 419 * * * street, and M. A. Smith, 419½ * * * street. In giving the order for removal of meter she gave the number of 419½ instead of 419. Consequently the number of meter to be taken out was correctly given, as per request. This consumer is of the kind of woman who likes to talk. Of course, there was a slight annoyance in having her gas shut off, but that was nothing compared to the lack of satisfaction because the company's man would not talk.

A Distribution Experience.—From the distribution department, I have an experience which caused considerable annoyance for both gas and electric workers. At an electric manhole it was noticed that, every time there was occasion to open it, it seemed filled with gas, and all the while the men were at work it was a source of annoyance. Just where this gas came from was hard to determine. Finally it was noticed that on the sidewalk there was a drippipe. It was also noticed that the iron conduit which ran from the manhole, came up on the opposite side of the same hole. These no doubt had both been in use for many years without any trouble occurring. I have some blueprints here showing the position of gas main, drippot and manhole, which will show you better than I can describe what the conditions were underground. Nearby are the tracks of the electric railway systems. No doubt, after you look at these blue prints, you will discover what took place and how gas got into the manhole and so drove out the electric man.

Final.—The manufacturing end of our business seems to have reached a state of perfection, as I have not received any experiences along that line. However, we all know that the use of California oils and the aid of improved generating systems have brought this branch of our business up to a standard that will be hard to improve. A member contributes the following which gives a little inside light on present processes: A complaint came in from a house in * * * that a very bad smell was passing all through the premises, and a request was made that some one be sent out to look for a leak. The complaint was given immediate attention, and a small leak was found at the inlet joint of meter. The woman of the house does her banking business with the Hibernia Bank and this is what she had to say about the manufacture of gas: "And so ye found a leak! did ye? And sure that is what has been making me bill so big! Its rotten stuff ye's are making and calling gas!" The man at once began to defend the method of manufacture and the quality of gas. "Oh," she said, "don't talk to me, young man! I know all about it. Sure my old man works at the gas works and manys the time I have taken his lunch to him down there. He works in the purifying room, and I know that ye uses ould, nasty, black oil and shavens, for my old man do be working thim shaving, so he does." This, of course, explains the whole process of manufacture from the receipt of the oil in cars at the works until it finally passes through the purifying boxes ready to do its work for the housewife!

ADVICES from Holley, N. Y., under date of the 10th inst., are to the effect that the Board of Trustees are in receipt of a communication from the Brockport (N. Y.) Gas Light Company, that the latter is now in a position to furnish gas to the residents of Holley. Some time ago the Board granted such right, but the proposition was not completed. According to the village laws of New York the matter of granting a franchise must be submitted to the voters, in instances where there is a plant on lighting account maintained by the municipality. The latter is the case in Holley.

New Methods and Appliances.

CHARGING WOOD IN COAL GAS RETORTS.—In a paper read by Mr. B. L. Taylor, before the Victorian Gas Managers Association, the author said that when carbonizing Maitland coal, and producing 11,500 cubic feet of gas per ton, the candle power was too high to obtain the best results from incandescent burners—especially the inverted type. He, therefore, looked round for some method of reducing it profitably, and decided to try the effect of carbonizing a small quantity of wood with the coal. They have three varieties of wood in their district, grey box, red box, and red gum, and decided to order two cords of grey box for testing purposes, and obtained it in 4 feet lengths. He commenced by carbonizing 90 per cent. coal and 10 per cent. wood. The settings are in beds of threes; and the method adopted was to charge 2 retorts with coal only, and one with about two-thirds coal (at the back) and one-third wood. This system worked fairly well until he increased to about 15 per cent. of wood, when complaints began to come in. On investigation, it appeared as though the wood gas was not mixing properly with the coal gas, the supply coming through in such a manner as to cause a great deal of fluctuation in the illuminating power of the lights. As this was so unsatisfactory, he discontinued using wood till a more reliable method could be devised. When matters had assumed their normal condition, he started again, using 15 per cent. of wood right away, but in this instance distributing it evenly in the 3 retorts—first charging about ¼ cwt. of coal, then throwing in the wood about the middle, and filling the remainder of the retort with coal so as to completely cover the wood.

After 3 days' working, and when everything appeared to be going well, complaints as to the poor quality of the light were again received from all parts of the district, and things looked rather serious. But as complaints were so general, and there appeared to be no fluctuation in the lights, as previously, he immediately set to work readjusting all burners, with very satisfactory results. For some time he continued using 15 per cent. of wood without experiencing trouble. He then increased to 20 per cent., using the same method, but consumers again made complaints. He then tried the red gum, and quickly found that he was able to use up to 33⅓ per cent. of this wood before any complaints were made. As soon as complaints started he reduced the wood to 25 per cent., and this quantity he had been carbonizing continuously for about 18 months. He also tried red box, and found it on a par with the red gum. Using this percentage of wood, he had no complaints about the unsatisfactory working of cookers, engines, irons, water heaters, lights, etc. The method of testing for the correct percentage of wood was to use an ordinary No. 5 flat flame burner, and by careful observation, after a little experience, it was easy to judge the maximum quantity for safe working. When using 25 per cent. of wood, the top of the flame starts to break from its arc, and about ⅛ inch from the top a very thin blue line becomes visible right across it. Wheu this percentage is exceeded, then close under the blue line a faint purple line appears, which in places break into the blue line. A decrease of wood is noticeable by the disappearance of these lines. Of course, the percentage of wood is also largely governed by the heat of the setting. When the retorts are drawn, the best coke is picked out for sale, and the charcoal, along with the poorer coke, is used for firing. He found that, when using the wood, they had perfect lighting, carboned mantles being practically unknown with any kind of burners, and they required very little attention. In addition to these beneficial results, much less carbon gathers on the retorts, and they are very easily scurfed. Since using the wood, no traces of naphthaline were noticed, and condensation in mains, services, and fittings had almost entirely disappeared. Being somewhat anxious as to the effect on meters, he selected three or four which had been in use passing mixed gas for nearly 2 years, and had them sent down for testing. They were in perfect order, and the diaphragms were as when new. Their average yield per ton of coal and wood carbonized for the last half year was 11,800 cubic feet. The wood was weighed up in the same manner as the coal, and charged to the coal account in working out the rate per ton. He also tested for the make of gas per ton on coal only, and got the same average. He was, therefore, not suggesting that one can produce more gas per ton carbonized by using wood, but if it can be obtained at a reasonable price, it was a distinct advantage as an aid to successful distribution in country towns. He was unable to give me any definite opinion as to the calorific value of the gas, as I had no instruments for testing this, but from practical

experience and its successful use with all appliances, he assumed it was fairly high.

A Source of Error in Analyzing Spent Oxide.—Mr. A. R. Myhill, in the *Gas World*, says that in testing spent oxide for sulphur, it is necessary, after extracting the sulphur with carbon bisulphide, to evaporate the solvent and heat the flask containing the sulphur in an air oven for a short time, until weighing and re-weighing show that all the CS_2 vapor has been removed from the flask. In addition, it is essential that air be drawn or blown through the flask at intervals, to assist the action of the heat in removing the heavy vapor from the bottom of the flask. Unless most of the CS_2 vapor is thus removed from the flask after distilling off the liquid, *before* placing it in the oven, it is highly probable that the heat of the oven will cause the carbon bisulphide in the flask to burn slowly, and almost imperceptibly, thereby depositing a film of sulphur on the inside of the flask. This sulphur is not from the original oxide, but is formed by incomplete combustion of the CS_2, and, therefore, tends to give a result higher than it should be. When carbon bisulphide burns in excess of air it forms CO_2 and SO_2, thus:

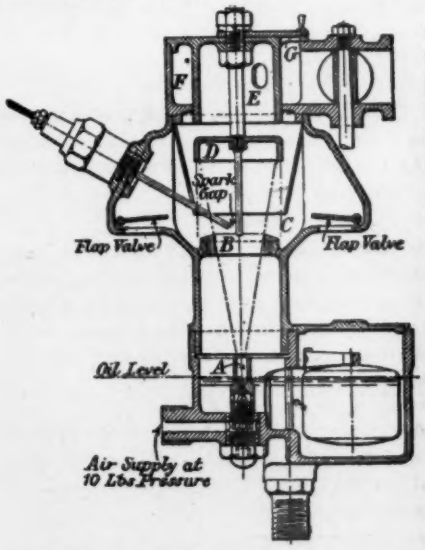
$$CS_2 + 3O_2 = CO_2 + 2SO_2.$$

If, however, insufficient air is present, carbon dioxide and sulphur are formed, thus:

$$CS_2 + O_2 = CO_2 + 2S.$$

It is this sulphur which collects on the side of the flask when it is put in a hot oven. That such is the case may easily be seen by two experiments: Ignite a spot of carbon bisulphide on a clean watch-glass, and note the smell of sulphur dioxide and the absence of any deposit. Then pour a drop of CS_2 into a flask with a narrow neck, and, after covering the flask with a cloth (to prevent danger in the very improbable event of an explosion), apply a light to the vapor at the neck of the bottle. The vapor will burn slowly, and, having insufficient air for its complete combustion, will leave a deposit of sulphur inside the vessel.

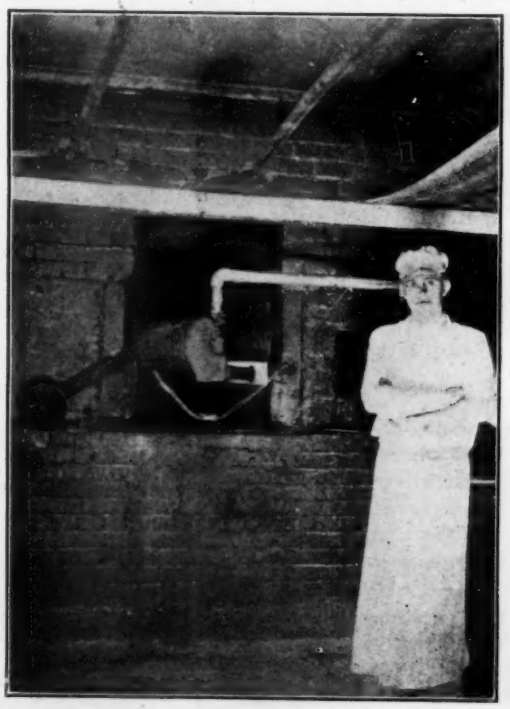
A Carbureter Using Gas Oil.—A combined carbureter and suction gas producer, using oil as fuel, has been developed in England by the Commercial Cars, Ltd. The apparatus, while primarily intended for motor cars, can be used for stationary engines, and a 15-horse power Crossley gas engine has been operated for a considerable period on gas made by one of them. It is a carbureter, in which only a portion of the fuel is gasified, the remainder reaching the cylinder as vapor. The heat necessary for the evaporation of this portion of the fuel is supplied by the partial combustion in the producer of part of the fuel fed. The air supply for this combustion is restricted, thus converting the carbon in the fuel into carbon monoxide.



The float chamber at the right contains the fuel oil at the proper level. Compressed air, at a pressure of from 7 to 10 lbs. per square inch, is pumped through the ejector, *A*, and sprays a portion of the fuel, as indicated by the dotted lines. The edges of the jet are cut off by the diaphragm, *B*, and the intercepted particles fall back into the oil supply at the bottom of the producer. The remaining oil passes into the combustion chamber, *C*, at the top of which is a baffle, *D*. The whole of the spray is intercepted by this baffle, and falls to the bottom of the chamber, *C*, and through the small holes therein back into the oil tank. If, however, the engine is at work, the suction draws air through the two float valves, and the oil spray in the combustion chamber is ignited by the spark passed across the gap shown. Due to the restricted air supply, however, only partial combustion occurs, burning the fuel to carbon monoxide, and liberating hydrogen. These gases, with some of the ungasified portion of the spray, pass through the hole, *E*, and around the annulus, *F*, through the throttle valve, into the cylinder. The air necessary for the completion of the combustion in the cylinder enters at *G*, being regulated in amount by the slide. The ignition of the mixture in the chamber, *C*, by a spark is necessary only at starting. Combustion will continue thereafter as long as the engine is in operation. The air supply necessary for spraying the oil is obtained from one of the engine cylinders, and no air tank is necessary. A special valve in connection with a filter is interposed between the cylinder and the bottom of the producer. This valve is provided with two seats, seating on one when the cylinder pressure is too low, and on the other when the pressure is too high. Connection with the producer is made only when the cylinder pressure is between 7 and 10 pounds.

The O'Malley Gas Water Heater.—The Ira J. O'Malley Company is said to be meeting with much success in marketing a heater, to which has been given the somewhat fantastic title of the "Submarine Water Heater," an illustration of which is here shown. The device is intended for placing in a bath or laundry tub, or other kindred receptacle, and consists of a nickel plated copper casing in the interior of which is a coil heated by an inverted gas burner. When the heater is placed in the water connection between it and the gas supply is made by a flexible tube. It is claimed that, as the flame is completely surrounded by water, the heat is practically all absorbed, and that a high degree of economy in gas consumed is effected. No figures, however, are given.

Gas-Fired Bake Ovens.—In the Pacific Service "Magazine," for October, Mr. C. A. Ross thus tells what the Pacific Gas and Electric Company has done for the bakers of San Francisco: "For years it was the universal custom to fire bake ovens with 4-foot pine wood—a method entailing considerable expense, long hours of splitting of wood, back-breaking work, and accumulation of unnecessary dirt.



Latterly crude oil has been used somewhat, but when the owner of the average small bake-shop figures he has to spend from $300 to $500 to set up an oil burning plant, he hesitates. During the last 18 months we have converted 71 baker's ovens to gas fuel, and hope to

more than double that number next year. The burner we employ is made in San Francisco, and consists of a swinging arm to which a 1/20-horse power motor, direct-connected to a small fan, blasts the gas through a spray nozzle and heats the oven to a cherry red. It requires about an hour to bring an oven to the necessary heat, and the cost of gas per day will average 75 cents. A careful baker can pay for the cost of the burner in a year in the saving on his wood bill, and one pleased customer who conducts a commercial pie bakery told the writer that he had increased his output 50 per cent., and saved from $8 to $10 per month in his fuel bill."

Book Reviews.

"*Technical Gas and Fuel Analysis*," by Alfred H. White, Professor of Chemistry, University of Michigan, Ann Arbor, Mich. Published by McGraw-Hill Book Company, Inc.; 276 pages, 5½ by 8; illustrated; price $2. The author treats first of gases, proper methods of sampling being given, and then follow clear descriptions of technical analyses and exact analyses, determinations of heating value, etc. Liquid fuels are briefly treated, then the coal fuels, in the same sequence of steps as for gases. This excellent, thoroughly practical treatise, gives nice directions for accurate working in conformity with the latest adopted standards and methods. It is just such a work that one would expect from the thought and pen of a clever teacher and zealous student, both of which the author undoubtedly is.

"*Proceedings*," *Vol. V., Natural Gas Association of America*, just to hand, show anew the capacity of Secretary T. Clive Jones for clever work, and speedy work. The meeting this year was held in Cleveland during virtually the last week in May, yet here is the Volume (and it has within its covers 20 score of pages), all complete Besides the papers (which are profusely and clearly illustrated) and the discussions thereon, it carries the membership lists, cross-carried as to persons and localities, the lists of officers, a direct categorical content mention, and an appendix. As to printing, binding and general get up, it is a credit to the Association, to its Editors and to its Publishers. A further noteworthy feature is a splendid vignette of that Prince of Natural Gas Men, Mr. Martin B. Daly, of Cleveland, whose presidential direction of the Eighth Annual Meeting was effective and considerate.

Items of Interest
FROM VARIOUS LOCALITIES.

"L. R. D.," writing from Jenkintown, Pa., under date of the 10th inst., says: "Another demonstration of the inestimable value of the Draeger pulmotor device, in service in the Jenkintown Division, Philadelphia Suburban Gas and Electric Company, happened late last September. A hurry 'phone call, from the office of Dr. J. B. Carroll, a prominent physician of Hatboro, Pa., was received in the Wyncote office of the Company about mid-day, advising of an attempt at suicide with gas in that town, and requesting that the pulmotor be sent immediately. Messrs. Brown, Chidsey and Simonin, officials of the Company thoroughly familiar with the operation of the apparatus, immediately cranked-up one of the Company's high-powered auto machines, and, within 12 minutes after the call was received, were at the scene of the happening, a distance of 7 miles from the office. Although the patient was unconscious when discovered, and the physician had given up hope of resuscitation by the old methods, there was still a very weak heart action. The pulmotor was at once applied, and, after a lapse of some minutes, evidences of returning consciousness were manifested by the victim. An hour later the danger was over, and another rescue had been added to the long list of those saved by the named apparatus. The latter is kept in the office of the Company, ready for instant use upon demand at any hour of the day or night."

"T. D. M.," writing from Chicago, under date of the 6th inst., says that Mr. Charles L. Holman, President and General Manager, the Laclede Gas Light Company, St. Louis, announced last week that his Company had closed a contract with the Consolidated Coal Company, of Baltimore, Md. (and other important business centers) for its supply of gas coal for 5 years, from January 1st, 1914. It was stated that that supply will come from the new working of this Company at Jenkins and McRoberts, Ky. The gas supply for the Laclede district requires the carbonizing of about 200,000 tons of gas coal, in addition to its requirements for water gas. Eighteen months hence, when the Koppers' ovens (now under construction) are completed, the coal requirements will be increased about 100 per cent. The Consolidated Coal Company has rented rooms in the beautiful new office building of the Laclede Gas Company, with a view to establishing business quarters in St. Louis.

THE Public Service Commission, Second New York District, assented to the petition of the Syracuse Suburban Gas Company for the right to exercise a franchise, granted by the Town Board of Dewitt, to lay mains for the distributing of gas to the residents along certain named streets in the vicinity of East Syracuse.

"RANDOLPH," writing from Haverhill, Mass., incloses this mention: "One of the prettiest and best possible demonstrations of how to use gas in the home, during the continuance of the exposition of 'Trade in Haverhill Days,' was open afternoons and evenings all the first week in October, at the offices of the Haverhill Gas Company, Academy of Music building. Commercial Manager Christian and Mr. Charles Stone laid out the plan, which represented the rooms of a modern home. In these were deftly and invitingly displayed types of modern illumination means and devices that rob the kitchen from disorder. A capable demonstrator and a skilled baker were in charge. Possibly the device that attracted most attention was a circular bake oven, in which several dozen loaves of bread were baked, the greater percentage of which was divided between the Hale Hospital and the City Hospital. Other cooking and heating devices, the use of which means the spread of ease and economy, comprised chafing dishes, percolators, egg cookers, and the like. The rooms were prettily decorated, and the illumination points so arranged as to bring out the best results. All told, the show in its entirety was most interesting and instructive, and amply illustrated the fact that the Company and its men are always alert to making the best of a good opportunity."

"J. H. S.," writing from Rochester, Minn., under date of the 7th inst., says, that the actual cash receipts for gas sold by the Rochester Light, Heat and Power Company during September last exceeded those for the corresponding month of 1912 by 42 per cent. Further, that for all the months (to October first) of 1913 show an average gain in cash receipts, compared with those for 1912, amounting to 25 per cent.

FOR the twelvemonth ended August 31st the gross earnings of the Blackstone Valley Gas and Electric Company, of Pawtucket, R. I., were $1,306,617, as compared with the preceding twelvemonth—a gain of $123,184. The respective net amounts were $511,904, and $351,203, a gain of $160,701. The surplus over all charges in a like comparison, amounted to a gain of $76,916.

MR. H. C. FRITZ, Manager, Reliable Stove Company, informs us that such will hereafter be the title of this Division of the American Stove Company. Heretofore the Division title was that of the "Schneider & Trenkamp Company.

MR. JOHN C. D. CLARK, General Manager, Utah Gas and Coke Company, Salt Lake City, has favored us with copies of the booklet yclept "Kitchen Counsel," the circulation of which has done much to advance the use of gaseous fuel in Salt Lake. We have no doubt Mr. Clark will willingly forward specimen numbers to any who ask for same.

THE bondholder's committee that recently bought in the Seaford (Del.) plant of the South Delaware Gas Company, will continue to operate the business thereof, retaining the former management. It is proposed to put $10,000 in additions and betterments.

ON the 6th inst. Mr. Louis Stotz, Secretary, National Commercial Gas Association, addressed the employees of the La Crosse (Wis.) Gas and Electric Company. The subject of his remarks was the educational work that is being so successfully carried on by the Association. Mr. Thurston Owens, of the La Crosse Company, announced that the Company would pay one-half the tuition fees of all employees completing the course. Some 25 employees have signified their intention of taking up the course and a Class will be formed at

once, with meetings every fortnight during the winter, in the Club rooms located in the Company's office building. Mr. Emil Niemeyer has been selected as class leader, and will be glad to receive communications from those doing work of a similar nature in other cities.

THE Georgetown (S. C.) Gas and Electric Company has been incorporated, with a capital of $100,000. Its officers are: President, Clawson Bachman; Vice-President, James M. Tyson; Treasurer-Secretary, Joseph T. Hayden.

AT the annual meeting of the shareholders in the Baltimore Consolidated Gas, Electric Light and Power Company, the only change made in the outgoing Directorate was the naming of Mr. Thomas Aitken (London, England), replacing Mr. George Cator (Baltimore), resigned. Mr. Cator declined a re-election, his health having been somewhat impaired. His successor, Mr. Aitken, is Manager of the London branch, Bank of Scotland, and it was largely through his effort that the Baltimore Corporation's power division securities were placed abroad. The Directors subsequently perfected the following organization: President and Chairman, Executive Committee, J. E. Aldred; Vice-Presidents, Herbert A. Wagner and Chas. M. Cohn; Treasurer, John L. Bailey; Secretary, William Schmidt, Jr.

RECENT advices from Dubuque, Ia., are to the effect that the members of the City Council, wearied of their attempts at gaining a conference with the officials of the local electric company as to an all-night schedule, have unanimously invited the Key City Gas Company's representatives with a view to arranging a contract for the lighting of all the lamps, on the streets and in the public buildings.

"V. M. L.," writing from Peoria, Ills., under recent date, says: "Corporation Counsel Radley, having been asked to consider the question of the franchise held by the Central Illinois Light Company, as to its right to use the city's streets for supplying steam heat, in submitting his report said that the franchise (granted in 1897 to one Wm. H. Becker), became void on the death of said grantee in 1912. The document did not provide that the franchise was transferable on the death of said grantee. However, he did not think this was material, for the Company was operating under another franchise granted to the Gas and Electric Company in 1906; and that the latter was, *pro forma*, supplemental to the Becker grant, but the former did not expire until 1947. Ald. Lowe, being in a receptive mood, moved that time be taken to digest the opinion, which caused Ald. Jobst to remark, 'Well, let, Ald. Lowe carry on the 'digesting,' he to report by 1947 (when the current franchise expires by limitation), by which time he should be ready to dine again!"

THE proprietors of the Elizabethport Gas Company, of Elizabeth, N. J., will build (in fact, is building) a storage holder on North avenue, near Scotch Plains road, to ensure the efficient supply of gas to certain outlying settlements.

IN the betterments contemplated by the Brooklyn Borough (N. Y.) Gas Company a storage holder up to retaining 2,000,000 cubic feet is a prominent item. This vessel will be located in that section of Coney Island where the "amusement caterers" are thickest, and these in concert opposed the proposed construction on the ground that such a structure, being unsightly, would add greatly to the danger of conflagration. Just think of it! The Hebrew gentlemen who abound in the "Coney Island Gut" complaining of the unsightliness of anything that could be known or mentioned—*vide* some lines from the book of Webster! And, think of it again! Could anything more be conducive to conflagrations than the flimsy shacks in which many of them conduct shows that would not be tolerated in Algiers? Their objections, however, were overruled by the authorities.

A DELEGATION of citizens (and prominent ones, at that) recently appeared before Public Service Commissioner Maltbie (First New York District) to urge that the Woodhaven Gas Company, which supplies with gas that part of South Long Island lying between East New York and Richmond Hill, be ordered to extend its main system, to and through the settlements known as South Aqueduct, the Howard Estates and Ramblersville. One of the citizens was the redoubtable Col. Michael J. Dady, who represented the Howard Estates in the argument, and his very commonsense appeal was based on the fact that many of the residents were obliged to install gasoline gas plants, thus adding to the danger from conflagration, with a consequent large increase in payments on insurance account, to say nothing of the unsatisfactory agency employed. Mr. John J. Kuhn, for the Company, opposed the plea, mainly on the ground that the population reachable did not warrant the expenditure—this latter was put at $26,000! Well; the Colonel to us would seem to have the better of the argument, for the district involved is not over 4 miles square, and its population certainly must exceed 25,000. Further, there is no doubt that 500 consumers could be secured forthwith in the territory concerned. Again, the erection of new structures therein is really remarkable.

MESSRS. T. W. WEITKNECHT (South Bethlehem), O. E. Wasser (West Bethlehem), and F. C. Nickolay (Bethlehem), have applied for charter, under which to operate the Lower Saucon-Bethlehem Gas Company to serve the residents of these Pennsylvania settlements: Lower Saucon, South Bethlehem, Freemansburg, Northampton Heights, Hellertown, that part of Bethlehem in Northampton county, Pa.; also, the Salisbury-Hanover Gas Company, to perform a like service in these settlements: Salisbury and Hanover, Fountain Hill, and that part of Bethlehem in Lehigh county. The capital of each is nominally $5,000, and the offices of the corporation are to be in Bethlehem, proper.

"DAVIS," writing from Holland, Mich., under date of the 10th inst., says: "Both offers, made by the Holland Gas Company's proprietors to the authorities of Holland, were rejected at the special election held here this week. The first was the terms under which the Company would sell to the city; the second was to amend the Company's franchise so that it could charge a 90 cent flat rate per 1,000 cubic feet. The vote on the first proposition was: In favor, 444; against, 812. On the second proposal the vote was: In favor, 616; against, 632.

ON the 13th inst., the Pacific Gas and Electric Company announced the practical completion of the 215 foot level of the immense concrete dam in the canon of the South Yuba river, below Lake Spaulding close to the summit of the Sierra Nevada. When completed, this dam will be the largest in the world, having the great height of 305 feet. The purpose of the mammoth structure is to impound the waters of the South Yuba which flow into Lake Spaulding. Accordingly the lake will be caused to act as a storage reservoir, of 100,000 acre-feet capacity. Besides the use of this vast water body for domestic and irrigation purposes, in Nevada and Placer counties, it will yield 190,000-horse power of electric energy to the plant of the Pacific Gas and Electric Company.

MR. C. E. DOUGHERTY, formerly Cashier and Bookkeeper to the Salinas (Kas.) Light and Power Company, has been appointed Commercial Manager of the Junction City (Kas.) Gas Company. He assumed his new tasks last Wednesday. Mr. John York succeeds Mr. Dougherty in Salinas.

MR. HOLLIS GODFREY, who has been Acting Chief Inspector of Meters, Philadelphia, Pa., has been permanently appointed to the position by Director Corts, of the Department of Public Works. He was first on the eligible list, by virtue of an examination under civil service rules recently completed.

"B. S. M.," writing from Reading, Pa., says that in the test case of Reading, against Consumers Gas Company of that city, brought by the authorities to recover a penalty of $50, through the Company's failure to set in a stopcock at the curb, having made a service connection with the street main, Judge Endlich decided against the city. The Judge declares that the ordinance of Select Councils, under which the ordinance was brought, is inoperative, because it fails to stipulate that the Company must install the stopcocks. The ordinance reads that any person, firm or corporation is the party in question which might be construed to mean that the property owner was the responsible party.

The Market FOR GAS SECURITIES.

The continued presenting of disquieting news as to our relations with Mexico, the hoarding of cash, the timidity of capital generally, all contributed to a weakness in the general share market which lowered quotable values all round. Consolidated is off 2½ from the bid of last week, the quotation for it this morning (Friday) being 128 to 128½. The decline, however, must not be taken as indicative of intrinsic weakness. In fact, the Company's position as a money-earner becomes continuously stronger. The underlying bond issues are firm, and the inquiry on such account continues.

Possibly the best investment to-day in gas shares is afforded by Brooklyn Union, which came in this morning at the ridiculously low figure of 119½ to 123. There is, however, no record of transactions therein, so the figures may be regarded as more fanciful than real. Peoples, of Chicago, is 123 to 124, despite the official declaration that hereafter the stock may be considered on an 8 per cent. basis. The special meeting, to authorize an increase of $15,000,000 in the capital (to $50,000,000), and to provide for refunding the bond issues is set for November 6th.

The Fall River (Mass.) Company's special stock holders' meeting, to consider the advisability of issuing 2,700 additional shares, is set for the 28th inst., which we suppose is intended to be supplemental to its current petition before the State Board to approve an issue of 1,500 shares. Washington (D. C.) gas is 425 bid, and U. G. I. shares are up 2 points.

The Fidelity and Trust Company, of Philadelphia, advertises a sale (at auction, Nov. 6th) of all the belongings of the Beaver Falls (Pa.) Gas Company, the sequel to a foreclosure concerning default on a mortgage, issue made in October, 1892.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

OCTOBER 20.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par alue of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$99,816,500	100	128	128⅛
Central Union Gas Co. —				
1st 5's, due 1927, J. & J.	8,500,000	1,000	101	103
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	8,600,000	100	157	157
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	99	101
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	59	62
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98¼	100¼
New York and East River—				
1st 5's, due 1944, J. & J.	8,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	96	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	102
Standard	5,000,000	100	102	104
Preferred	5,000,000	100	93	94
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	90	95
The Brooklyn Union	15,000,000	1,000	119½	123
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Chicago Gas Co. Guaranteed				
Gold Bonds	7,680,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	69	70
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus Gas Light & Fuel				
Company	1,682,750	100	65¼	66⅛
Preferred	3,026,500	100	33	35¼
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co.,				
1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of				
New Jersey	10,500,000	—	130	133
" Bonds, 5's	10,500,000	—	104	106
Indianapolis	2,000,000	—	85	90
" Bonds, 5's	2,650,000	—	93	93
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	98½	99
Laclede Gas Co., St. Louis.	10,000,000	100	98	102
Preferred	2,500,000	100	—	102½
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	120	130
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	
Massachusetts Gas Companies, of Boston	25,000,000	100	92	93
Preferred	25,000,000	100	92	93
Montreal L. H. & P., Canada	9,000,000	100	205	207
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	5,000,000	25	182	190
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	123	124
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105¼
Pacific Gas and Electric Co.	15,500,000	—	38½	38¾
St. Joseph Gas Co.—				
1st Mtg. 5's	1,000,000	1,000	96	98
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	105
Extension, 6's	600,000	1,000	112¾	115
General Mortgage, 5's	3,447,000	1,000	94	96
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
United Gas Imp. Co.	55,502,950	50	167	168
Washington (D. C.) Gas Co.	1,600,000	200	423	430
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	—	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, New York, October 21, 23, 1914. Officers: President, W. H. Gartley, Philadelphia. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting————1914. Officers: President, A. A. Dion, Ottawa; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct., 1914. Officers: President, J. T. Hutchings, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Monthly Section Meetings; Grand Commissioner, Will. W. Barnes. East Orange, N. J.; Gen'l Sec'y, H. Thurston Owens, La Crosse, Wis.; New York Section, Chairman, W. H. Pettes; Secretary, G. E. Smith, Sipp Avenue, Jersey City, N. J. Philadelphia Section; Chairman, Stanley Grady; Secretary, H. E. Stiteler, Broad and Arch streets. Cleveland Section, Chairman, F. R. Hutchinson; Secretary, Wm. Holtz, East Ohio Gas Co. New England Section, Chairman, T. W. Jennings, Boston; Sec., F. K. Wells, 69 Broad street, Boston. Winona Section, Winona, Minn., W. F. Clausen, Chairman. Bethlehem Section, Trueman Weithnecht, Chairman; Sec.-Treas., Truman Buss. South Bethlehem, Pa.

Guild of Gas Managers of New England.—Annual meeting, March, 1914. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, March 18th and 19th, 1914. Chicago, Ills. Officers: President, W. F. Barrett, Chicago, Ills.; Secretary-Treasurer, Horace H. Clark, 115 No. Oak Park avenue, Oak Park, Ills.

Illuminating Engineering Society.—Annual meeting, Cleveland, O., September, 1914. Meetings of Sections, monthly. Pres., Charles O. Bond; General Secretary, J. D. Israel, 29 W. 39th street, New York City. Sections: New York, Secretary, C. L. Law, 124 West 42d street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, J. B. Jackson, 28 North Market street. Pittsburgh, Secretary, J. C. Mundo, Oliver Building.

Indiana Gas Association.—Annual meeting, March —— —— 1914. Terre Haute. Officers: President, A. S. Cooke, Terre Haute; Vice-President, A. C. Blinn, Evansville; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, Davenport, May 27, 28, 29, 1914; Officers: President, B. C. Adams, Lincoln, Neb.; Secretary, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, October—— 1913. ———— Officers: President, L. O. Ripley, Emporia, Kas.; Secretary and Treasurer, W. H. Fellows, Leavenworth, Kas.

Michigan Gas Association.—Annual meeting, September, 1914. Place, undetermined. Officers: President, H. W. Douglas, Ann Arbor, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1914; Mexico, Mo. Officers: President, P. A. Bertrand, Joplin, Mo.; Secretary and Treasurer, P. W. Markham, Brookfield, Mo.

National Commercial Gas Association.—Annual meeting and gas show, Dec. 1-6, 1913, Philadelphia, Pa. Officers: President, C. W. Hare, Philadelphia Pa.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, St. Louis, Mo., May 19 and 20, 1914; Officers: President, E. L. Brundrett, Kansas City, Mo.; Secy-Treas., T. Clive Jones, Delaware, O.

New England Gas Association.—Annual meeting, February, 18th and 19th, 1914, Boston. Officers: President, T. H. Hintze, Providence, R. I.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—Annual Meeting, July —, 1913, Asbury Park N. J. President, C. F. Butcher, Freehold, N. J.; Sec'y-Treasurer, O. F. Potter, Newark, N. J.

Ohio Gas Association.—Annual meeting, February ——— 1914 Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—Annual meeting, Oklahoma City May, ——1914. President, F. E. Bowman, Ada; Secretary-Treasurer, H. V. Bone Oklahoma City.

Pacific Coast Gas Association.—Annual meeting, Long Beach, Cal., September ——— 1914. Officers: President, C. S. Vance. Los Angeles, Cal.; Secretary-Treasurer, Henry Bostwick, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, Allentown, Pa., April ———, 1914; Officers, President, J. A. Frick, Allentown, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting Dec., 11, 1913; monthly meetings, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city.

Southern Gas Association.—Annual meeting, Mobile, Ala., April 4, 1914, Officers: President, James Ferrier, Rome, Ga.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting, May———— 1914, Galveston, Tex. Officers: President, G. H. Gifford, Fort Worth Tex.; Secretary H. S. Cooper, 405 Slaughter Bldg., Dallas, Tex,

Wisconsin Gas Association.—Annual meeting, May ———1914, Milwaukee. [illegible]ned Officers: President, Ewald Haase, Milwaukee, Wis.; Secretary-Treasurer, [illegible]rmed at Harman Milwaukee, Wis.